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SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: JOHN MAPLES Examiner #: 62294 Date: 10/10/06
Art Unit: 1745 Phone Number ~~30~~ 2-1287 Serial Number: 10/758,541
Mail Box and Bldg/Room Location: REM-6C89 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

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Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: ALKALINE STORAGE BATTERY

Inventors (please provide full names): SHIGEKAZU YASUOKA, TETSUYUKI MURATA, JUN ISHIDA

Earliest Priority Filing Date: 1/17/03

**For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

An alkaline storage battery comprising a negative electrode, a positive electrode comprising nickel hydroxide as a positive electrode active material, and an alkaline electrolyte, wherein the negative electrode comprises (a) a hydrogen absorbing alloy represented by $Ln_{1-x}Mg_xNi_{y-a}M_a$ (where Ln is at least one element selected from rare earth elements, M is at least one element selected from the group consisting of Al, V, Nb, Ta, Cr, Mo, Mn, Fe, Co, Ga, Zn, Sn, In, Cu, Si and P, $0.05 \le x < 0.20$, $2.8 \le y \le 3.9$ and $0.10 \le a \le 0.50$) and (b) carbon as a conductive agent, and hydrogen content in the hydrogen absorbing alloy is not greater than 0.01 weight % when the battery is activated and is discharged to 1.0 V at one hour rate (It).

* PLEASE SEARCH FOR THE HYDROGEN CONTENT IN THE NEGATIVE ELECTRODE. * THANKS!

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STAFF USE ONLY		Type of Search		Vendors and cost where applicable	
Searcher:	EL	NA Sequence (#)		STN	
Searcher Phone #:		AA Sequence (#)		Dialog	
Searcher Location:		Structure (#)		Questel/Orbit	
Date Searcher Picked Up:		Bibliographic		Dr.Link	
Date Completed:	10-11-06	Litigation		Lexis/Nexis	
Searcher Prep & Review Time:		Fulltext		Sequence Systems	
Clerical Prep Time:		Patent Family		WWW/Internet	
Online Time:		Other		Other (specify)	

PTO-1590 (8-01)

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=> file reg
FILE 'REGISTRY' ENTERED AT 11:20:21 ON 11 OCT 2006
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=> display history full l1-

     FILE 'LREGISTRY' ENTERED AT 10:17:11 ON 11 OCT 2006
L1             2 SEA (LNTH OR B3)/PG (L) MG/ELS (L) NI/ELS
L2             2 SEA L1 NOT ((A1 OR B4 OR ACTN OR SHEL OR A6 OR A7 OR
                 A8)/PG OR (C OR H OR BE OR CA OR SR OR BA OR RA OR AC OR
                 W OR TC OR RE OR RU OR OS OR RH OR IR OR PD OR PT OR AG
                 OR AU OR CD OR HG OR B OR TL OR GE OR PB OR N OR AS OR
                 SB OR BI)/ELS)
L3             1 SEA L2 AND 3<ELC.SUB

     FILE 'REGISTRY' ENTERED AT 10:24:40 ON 11 OCT 2006
L4           916 SEA L2 AND 3<ELC.SUB
                 SAV L4 MAP541/A

     FILE 'HCA' ENTERED AT 10:26:40 ON 11 OCT 2006
L5           290 SEA L4
L6        226936 SEA BATTERY OR BATTERIES OR (ELECTROCHEM? OR ELECTROLY?
                 OR GALVANI? OR WET OR DRY OR PRIMARY OR SECONDARY)(2A)(CE
                 LL OR CELLS) OR WETCELL? OR DRYCELL?
L7        235069 SEA ANOD## OR (NEG# OR NEGATIV?)(2A)ELECTROD##

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                 E HYDROGEN/CN
L8             1 SEA HYDROGEN/CN

     FILE 'HCA' ENTERED AT 10:30:34 ON 11 OCT 2006
L9         21766 SEA (L8 OR HYDROGEN# OR H2 OR H)(2A)CONTENT?
L10          161 SEA L5 AND L6
L11            3 SEA L10 AND L9

     FILE 'REGISTRY' ENTERED AT 10:31:49 ON 11 OCT 2006
L12            5 SEA (12310-65-5/BI OR 12409-96-0/BI OR 7439-95-4/BI OR
                 7440-02-0/BI OR 765835-21-0/BI)
L13            1 SEA L12 AND L4

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L14            2 SEA L13
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                 AMOUNT? OR CONC# OR CONCENTRATION? OR QUANTI? OR RATIO?
                 OR PROPORTION? OR EST# OR ESTN# OR ESTIMAT? OR CALCULAT?
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                  OR CALC# OR CALCN# OR MEASUR? OR COUNT? OR GAUGE? OR
                  METER# OR METRE# OR DIAL#)
L16             3 SEA L5 AND L9
L17            13 SEA L5 AND L15
L18           186 SEA L5 AND (L6 OR L7 OR 52/SC,SX OR 72/SC,SX)
L19            12 SEA L18 AND L15
L20         11327 SEA (WEIGHT# OR WT#)(2A)(PERCENT? OR PER(A)CENT?)
L21             0 SEA L5 AND L20
L22             4 SEA L11 OR L14 OR L16
L23            10 SEA (L19 OR L17) NOT L22


=> file hca
FILE 'HCA' ENTERED AT 11:20:31 ON 11 OCT 2006
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=> d l22 1-4 cbib abs hitstr hitind

L22  ANSWER 1 OF 4  HCA  COPYRIGHT 2006 ACS on STN
143:156362  Method of fabrication of hydrogen-absorbing alloy for
     alkaline battery.  Yasuoka, Shigekazu; Murata, Tetsuyuki; Ishida,
     Jun (Japan).  U.S. Pat. Appl. Publ. US 2005164083 A1 20050728, 8 pp.
     (English).  CODEN: USXXCO.  APPLICATION: US 2005-41678 20050125.
     PRIORITY: JP 2004-16553 20040126.
AB   An alk. storage battery including a pos. electrode, a neg. electrode
     using a hydrogen-absorbing alloy, and an alk. electrolyte soln.
     employs, as the hydrogen-absorbing alloy in the neg. electrode, a
     hydrogen-absorbing alloy for alk. storage batteries including at
     least a rare-earth element, magnesium, nickel, and aluminum, and
     having an intensity ratio IA/IB of 1.00 or greater, wherein IA is
     the strongest peak intensity appearing in the range
     2θ=32°-33° and IB is the strongest peak
     intensity appearing in the range 2θ = 35°-36° in
     an X-ray diffraction anal. using CuαKα radiation as the
     X-ray source.
IT   765835-21-0P
        (method of fabrication of hydrogen-absorbing alloy for alk.
        battery)
RN   765835-21-0  HCA
CN   Nickel alloy, base, Ni 59,Nd 15,Pr 15,La 7.5,Al 1.7,Mg 1.3 (9CI)
     (CA INDEX NAME)

Component    Component      Component
              Percent    Registry Number
```

Ni	59	7440-02-0
Nd	15	7440-00-8
Pr	15	7440-10-0
La	7.5	7439-91-0
Al	1.7	7429-90-5
Mg	1.3	7439-95-4

IC ICM H01M004-46
ICS H01M004-58
INCL 429218200; 420900000; 429223000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56
IT **765835-21-0P** 859437-20-0P
(method of fabrication of hydrogen-absorbing alloy for alk. battery)

L22 ANSWER 2 OF 4 HCA COPYRIGHT 2006 ACS on STN
142:432969 Influences of Ni addition on the structures and electrochemical properties of La0.7Mg0.3Ni2.65+xCo0.75Mn0.1 (x = 0.0-0.5) hydrogen storage alloys. Liu, Yongfeng; Pan, Hongge; Gao, Mingxia; Li, Rui; Lei, Yongquan (Department of Materials Science and Engineering, Zhejiang University, Hangzhou, 310027, Peop. Rep. China). Journal of Alloys and Compounds, 389(1-2), 281-289 (English) 2005. CODEN: JALCEU. ISSN: 0925-8388. Publisher: Elsevier B.V..

AB The effect of Ni addn. on the structure, H storage and electrochem. properties of La0.7Mg0.3Ni2.65+xMn0.1Co0.75 (x = 0-0.5) H storage alloys was studied. The structural study showed that the alloys mainly consist of a (La,Mg)Ni3 phase and a LaNi5 phase - the abundance of the (La,Mg)Ni3 and LaNi5 phases changed relatively with increasing Ni content. Pressure-compn. isotherms (P-C-T) indicate that with increasing Ni **content** the max. **H** storage capacity and the hysteresis for H absorption/desorption decrease, but the plateau pressure increases. Electrochem. studies show that the max. discharge capacity decreases from 395.1 (x=0) to 313.8 mA-h/g (x=0.5). With increasing Ni content the cycling stability of alloy electrodes did not improve. When x increases from 0 to 0.4, the electrochem. kinetic properties of the alloy electrodes improved due to the increase of the electrocatalytic activation of the surface and the increase of the H diffusivity in the bulk of the alloy.

IT **769963-04-4 850661-48-2 850661-49-3**
850661-50-6 850661-51-7 850661-52-8
(influence of Ni addn. on structure and electrochem. properties of La0.7Mg0.3Ni2.65+xCo0.75Mn0.1 hydrogen storage alloys for anodes of Ni-MH **batteries**)
RN 769963-04-4 HCA

CN Nickel alloy, base, Ni 50,La 31,Co 14,Mg 2.4,Mn 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	50	7440-02-0
La	31	7439-91-0
Co	14	7440-48-4
Mg	2.4	7439-95-4
Mn	1.8	7439-96-5

RN 850661-48-2 HCA
CN Nickel alloy, base, Ni 51,La 31,Co 14,Mg 2.3,Mn 1.7 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	51	7440-02-0
La	31	7439-91-0
Co	14	7440-48-4
Mg	2.3	7439-95-4
Mn	1.7	7439-96-5

RN 850661-49-3 HCA
CN Nickel alloy, base, Ni 52,La 30,Co 14,Mg 2.3,Mn 1.7 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	52	7440-02-0
La	30	7439-91-0
Co	14	7440-48-4
Mg	2.3	7439-95-4
Mn	1.7	7439-96-5

RN 850661-50-6 HCA
CN Nickel alloy, base, Ni 53,La 30,Co 13,Mg 2.2,Mn 1.7 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	53	7440-02-0
La	30	7439-91-0
Co	13	7440-48-4

Mg	2.2	7439-95-4
Mn	1.7	7439-96-5

RN 850661-51-7 HCA
CN Nickel alloy, base, Ni 54,La 29,Co 13,Mg 2.2,Mn 1.6 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	54	7440-02-0
La	29	7439-91-0
Co	13	7440-48-4
Mg	2.2	7439-95-4
Mn	1.6	7439-96-5

RN 850661-52-8 HCA
CN Nickel alloy, base, Ni 55,La 29,Co 13,Mg 2.2,Mn 1.6 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	55	7440-02-0
La	29	7439-91-0
Co	13	7440-48-4
Mg	2.2	7439-95-4
Mn	1.6	7439-96-5

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56
ST cobalt lanthanum magnesium manganese nickel alloy anode hydride **battery**
IT **Battery** anodes
(influence of Ni addn. on structure and electrochem. properties of La0.7Mg0.3Ni2.65+xCo0.75Mn0.1 hydrogen storage alloys for anodes of Ni-MH **batteries**)
IT **769963-04-4 850661-48-2 850661-49-3 850661-50-6 850661-51-7 850661-52-8**
(influence of Ni addn. on structure and electrochem. properties of La0.7Mg0.3Ni2.65+xCo0.75Mn0.1 hydrogen storage alloys for anodes of Ni-MH **batteries**)
IT 1333-74-0, Hydrogen, processes
(influence of Ni addn. on structure and electrochem. properties of La0.7Mg0.3Ni2.65+xCo0.75Mn0.1 hydrogen storage alloys for anodes of Ni-MH **batteries**)

L22 ANSWER 3 OF 4 HCA COPYRIGHT 2006 ACS on STN

141:317179 Alkaline **battery**. Ishida, Jun; Murata, Tetsuyuki; Yasuoka, Shigekazu (Sanyo Electric Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2004273261 A2 20040930, 13 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2003-62002 20030307.

AB The device comprises a pos. electrode, a neg. electrode made of H absorption alloy, and alkali electrolyte soln. The H absorption alloy contains rare earth element, Mg, and Ni and has a intensity ratio Ia/Ib ≥0.5, where Ia is of the strongest peak at 2θ=30°-34° measured by x ray refraction and Ib at 2θ=40°-44°. The increment of the O **content** in the **H** absorption alloy Wo to that of activated **battery** Wa (Wa-Wo) ≤0.9% or their ratio of ≤1.0 (wt)%.

IT **765835-21-0**
(H absorption alloy; alk. **battery** having neg. electrode made of H absorption alloy)

RN 765835-21-0 HCA

CN Nickel alloy, base, Ni 59,Nd 15,Pr 15,La 7.5,Al 1.7,Mg 1.3 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	59	7440-02-0
Nd	15	7440-00-8
Pr	15	7440-10-0
La	7.5	7439-91-0
Al	1.7	7429-90-5
Mg	1.3	7439-95-4

IC ICM H01M004-38
ICS B22F005-00; B22F009-04; H01M004-24; H01M010-30; C22C019-00

CC 52-1 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 76

ST alk **battery** hydrogen absorption alloy

IT Rare earth metals, uses
(H absorption alloy contg.; alk. **battery** having neg. electrode made of H absorption alloy)

IT Alloys, uses
(H absorption; alk. **battery** having neg. electrode made of H absorption alloy)

IT Primary **batteries**
(alk.; alk. **battery** having neg. electrode made of H absorption alloy)

IT Electrodes
(neg.; alk. **battery** having neg. electrode made of H absorption alloy)

IT 7439-95-4, Magnesium, uses 7440-02-0, Nickel, uses 12310-65-5,

Ce2Ni7 12409-96-0
(H absorption alloy contg.; alk. **battery** having neg. electrode made of H absorption alloy)

IT **765835-21-0**
(H absorption alloy; alk. **battery** having neg. electrode made of H absorption alloy)

L22 ANSWER 4 OF 4 HCA COPYRIGHT 2006 ACS on STN

141:159744 Measurement of hydrogen in alloys by magnetic and electronic techniques. Termsuksawad, P.; Niyomsoan, S.; Goldfarb, R. B.; Kaydanov, V. I.; Olson, D. L.; Mishra, B.; Gavra, Z. (Colorado School of Mines, Golden, CO, 80401, USA). Journal of Alloys and Compounds, 373(1-2), 86-95 (English) 2004. CODEN: JALCEU. ISSN: 0925-8388. Publisher: Elsevier Science B.V..

AB As demonstrated magnetic and electronic measurements can be used to quantify hydrogen availability, absorption, and desorption in materials for nickel metal-hydride **batteries** and hydrogen storage. The ability of a metal alloy to absorb and desorb hydrogen depends on the interaction of the metal's electronic bands with electrons donated or accepted by the hydrogen. The tendency of alloys to dissolve hydrogen and form hydrides depends on their performance as electron acceptors. Absorbed hydrogen may exist in either sol. (protonic) or bound phases. Magnetization and thermoelec. (Seebeck) coeff. were measured as functions of **hydrogen content** in powd. AB5- and AB2-type alloys. Magnetization decreases with increasing sol. hydrogen in ferromagnetic AB5-type (La-Ce)(Ni-Mn)5 and (La-Nd)(Ni-Co-Mn)5. However, magnetization increases with increasing sol. hydrogen in AB2-type (Zr-Ti)(Cr-Fe)2. Finally, magnetization does not change with increasing bound hydrogen in AB2-type (Zr-Ti)(Ni-Mn-Cr-V)2. The Seebeck coeff. for AB5-type (La-Nd)(Ni-Co-Mn)5 is a monotonically decreasing function of **hydrogen content**. However, the effect of absorbed hydrogen on the Seebeck coeff. of the AB2 alloys depends on whether the hydrogen is sol. or bound. The alloys were hydrided with up to 2.5 to more than 6 hydrogen atoms per formula unit, depending upon the alloy.

IT **731853-79-5**
(measurement of hydrogen absorbed by alloys by magnetic and electronic techniques)

RN 731853-79-5 HCA

CN Nickel alloy, base, Ni 59,Ce 16,La 15,Mn 9.3,Al 0.2,Mg 0.2 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	59	7440-02-0
Ce	16	7440-45-1

La	15	7439-91-0
Mn	9.3	7439-96-5
Al	0.2	7429-90-5
Mg	0.2	7439-95-4

IT **731853-79-5D**, hydrided
(with bound and sol. hydrogen; measurement of hydrogen absorbed by alloys by magnetic and electronic techniques)
RN 731853-79-5 HCA
CN Nickel alloy, base, Ni 59,Ce 16,La 15,Mn 9.3,Al 0.2,Mg 0.2 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	59	7440-02-0
Ce	16	7440-45-1
La	15	7439-91-0
Mn	9.3	7439-96-5
Al	0.2	7429-90-5
Mg	0.2	7439-95-4

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 48, 56, 76, 77
IT Absorption
Electron acceptors
Hydriding
Secondary **batteries**
(measurement of hydrogen absorbed by alloys by magnetic and electronic techniques)
IT **731853-79-5** 731853-80-8 731853-81-9 731853-82-0
(measurement of hydrogen absorbed by alloys by magnetic and electronic techniques)
IT **731853-79-5D**, hydrided 731853-80-8D, hydrided
731853-81-9D, hydrided 731853-82-0D, hydrided
(with bound and sol. hydrogen; measurement of hydrogen absorbed by alloys by magnetic and electronic techniques)

=> d l23 1-10 cbib abs hitstr hitind

L23 ANSWER 1 OF 10 HCA COPYRIGHT 2006 ACS on STN
145:30726 Effect of Mg on the hydrogen storage characteristics of Ml1-xMgxNi2.4Co0.6 (x =0-0.6) alloys. Tang, Rui; Liu, Yongning; Zhu, Changchun; Zhu, Jiewu; Yu, Guang (State Key Laboratory for Mechanical Behavior of Materials, Xian Jiaotong University, Xian, 710049, Peop. Rep. China). Materials Chemistry and Physics, 95(1), 130-134 (English) 2006. CODEN: MCHPDR. ISSN: 0254-0584.

Publisher: Elsevier B.V..

AB Ml1-xMgxNi2.4Co0.6 (x = 0-0.6) H storage alloys were prepd. by inductive melting and the effect of Mg on the crystal structure and H storage characteristics was studied. These alloys are LaNi3 phases with a PuNi3-type structure. The Mg substitution for Ml in the alloys leads to shrinkage of the unit cell vol. and a redn. of the stability of alloy hydrides. With increasing Mg substitution for Ml, the atom **ratio** of **H** to alloy (H/M) decreases, but the wt. **ratio** of **H**/M and the discharge capacity of the electrodes increase in a certain range of Mg content ($x \leq 0.4$). The Ml0.6Mg0.4Ni2.4Co0.6 alloy has the highest wt. **ratio** of **H**/M (1.75%) at 1 MPa H2 and 298 K and the largest discharge capacity of all the electrodes, 326 mA-h/g. An increase in Mg substitution for Ml results in better high-rate dischargeability and cycling stability of an electrode.

IT **889133-00-0 889133-01-1 889133-02-2**
(effect of Mg substitution on hydrogen storage characteristics of Ml1-xMgxNi2.4Co0.6 alloy **anodes** for Ni-MH **batteries**)

RN 889133-00-0 HCA

CN Nickel alloy, base, Ni 48,La 33,Co 12,Ce 2.3,Mg 1.7,Pr 1.5,Nd 1 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	48	7440-02-0
La	33	7439-91-0
Co	12	7440-48-4
Ce	2.3	7440-45-1
Mg	1.7	7439-95-4
Pr	1.5	7440-10-0
Nd	1	7440-00-8

RN 889133-01-1 HCA

CN Nickel alloy, base, Ni 52,La 27,Co 13,Mg 3.6,Ce 2,Pr 1.2,Nd 0.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	52	7440-02-0
La	27	7439-91-0
Co	13	7440-48-4
Mg	3.6	7439-95-4
Ce	2	7440-45-1
Pr	1.2	7440-10-0
Nd	0.8	7440-00-8

RN 889133-02-2 HCA
CN Nickel alloy, base, Ni 57,La 20,Co 14,Mg 5.9,Ce 1.4,Pr 0.9,Nd 0.6 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	57	7440-02-0
La	20	7439-91-0
Co	14	7440-48-4
Mg	5.9	7439-95-4
Ce	1.4	7440-45-1
Pr	0.9	7440-10-0
Nd	0.6	7440-00-8

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56
ST hydrogen storage cobalt magnesium misch metal nickel **anode battery**
IT **Battery anodes**
Secondary **batteries**
(effect of Mg substitution on hydrogen storage characteristics of Ml1-xMgxNi2.4Co0.6 alloy **anodes** for Ni-MH **batteries**)
IT 889132-99-4 **889133-00-0 889133-01-1 889133-02-2**
(effect of Mg substitution on hydrogen storage characteristics of Ml1-xMgxNi2.4Co0.6 alloy **anodes** for Ni-MH **batteries**)
IT 1333-74-0, Hydrogen, processes
(effect of Mg substitution on hydrogen storage characteristics of Ml1-xMgxNi2.4Co0.6 alloy **anodes** for Ni-MH **batteries**)

L23 ANSWER 2 OF 10 HCA COPYRIGHT 2006 ACS on STN
144:215851 Preparation of hydrogen storage alloy La0.67Mg0.33Ni2.5Co0.5 and its electrochemical properties. Wang, Dahui; Luo, Yongchun; Yan, Ruxu; Xing, Changce; Kang, Long (Key Laboratory of New Nonferrous Metal Materials, Lanzhou University of Science and Technology, Lanzhou, 730050, Peop. Rep. China). Xiyou Jinshu Cailiao Yu Gongcheng, 33(12), 1283-1286 (Chinese) 2004. CODEN: XJCGEA. ISSN: 1002-185X. Publisher: Kexue Chubanshe.
AB The La0.67Mg0.33Ni2.5Co0.5 hydrogen storage alloy with PuNi3-type was prepd. using induction melting followed by heat treatment. In order to compensate Mg loss during alloy melting, the different mass percent Mg was supplemented into the melt. The microstructure and

electrochem. properties of the alloys were investigated by using XRD and electrochem. method. The results show that the ingot is composed of main phase with PuNi3 type structure and a little second phase with CaCu5 structure. After heat treatment at 1223 K for 10 **h**, the **amt**. of the second phase in the annealed alloy is remarkably decreased and a more homogeneous and purified PuNi3 type microstructure is obtained in the case of 10% Mg supplement. The electrochem. analyses show that the electrochem. properties of the alloy, such as activation, capacity, cycling stability and discharge ability at different c.d., are well improved by supplementing proper Mg and annealing heat treatment. In comparison with AB5 type and AB2 with Laves phase hydrogen storage alloys, the La0.67Mg0.33Ni2.5Co0.5 alloy has high capacity and quite good kinetics of electrochem. reaction.

IT **308812-20-6**
(prepn. of hydrogen storage alloy La0.67Mg0.33Ni2.5Co0.5 and its electrochem. properties)

RN 308812-20-6 HCA

CN Nickel alloy, base, Ni 53,La 34,Co 11,Mg 2.9 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	53	7440-02-0
La	34	7439-91-0
Co	11	7440-48-4
Mg	2.9	7439-95-4

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56

IT **308812-20-6**
(prepn. of hydrogen storage alloy La0.67Mg0.33Ni2.5Co0.5 and its electrochem. properties)

L23 ANSWER 3 OF 10 HCA COPYRIGHT 2006 ACS on STN

143:250902 Degradation mechanism of the La-Mg-Ni-based metal hydride electrode La0.7Mg0.3Ni3.4Mn0.1. Liu, Yongfeng; Pan, Hongge; Gao, Mingxia; Lei, Yongquan; Wang, Qidong (Department of Materials Science and Engineering, Zhejiang University, Hangzhou, 310027, Peop. Rep. China). Journal of the Electrochemical Society, 152(6), A1089-A1095 (English) 2005. CODEN: JESOAN. ISSN: 0013-4651. Publisher: Electrochemical Society.

AB The degrdn. mechanism of the H storage electrode alloy, La0.7Mg0.3Ni3.4Mn0.1, during charge/discharge cycling was systematically studied using XRD, XPS, Auger electron spectroscopy (AES), SEM, EIS, and linear polarization measurements. The pulverization and the oxidn./corrosion of the active components

during cycling are the 2 main factors responsible for the fast capacity degrdn. The degrdn. mechanism of a La0.7Mg0.3Ni3.4Mn0.1 electrode can be split into the 3 consecutive stages: pulverization and Mg oxidn., Mg and La oxidn., and oxidn.-passivation. SEM observation indicates that the pulverization of the alloy particles is serious due to the high cell vol. expansion ratio of the hydride to alloy phase of (La,Mg)Ni3 and LaNi5. A large no. of cracks in the alloy particles and the electrode appear. XPS and AES analyses reveal that composite passive layers of Mg(OH)2 and La(OH)2 are formed continuously on the surface of alloy particles and increase in thickness with cycling. This porous film not only decreases the surface electrocatalytic activity but also retards the transfer of H into/or from the alloy particles to electrolyte, and decreases the **amt.** of **H** absorption elements La and Mg in the alloys as well.

IT **769963-01-1**
(disintegration of La0.7Mg0.3Ni3.4Mn0.1 alloy **anode** material in Ni-MH **batteries**)

RN 769963-01-1 HCA

CN Nickel alloy, base, Ni 64,La 31,Mg 2.4,Mn 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	64	7440-02-0
La	31	7439-91-0
Mg	2.4	7439-95-4
Mn	1.8	7439-96-5

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **72**

ST lanthanum magnesium manganese nickel **anode** degrdn metal hydride **battery**

IT **Battery anodes**
Secondary **batteries**
(disintegration of La0.7Mg0.3Ni3.4Mn0.1 alloy **anode** material in Ni-MH **batteries**)

IT **769963-01-1**
(disintegration of La0.7Mg0.3Ni3.4Mn0.1 alloy **anode** material in Ni-MH **batteries**)

L23 ANSWER 4 OF 10 HCA COPYRIGHT 2006 ACS on STN

140:342029 Electrochemical studies on La0.7Mg0.3Ni3.4-xCo0.6Mnx metal hydride electrode alloys. Liu, Yongfeng; Pan, Hongge; Gao, Mingxia; Zhu, Yunfeng; Lei, Yongquan; Wang, Qidong (Department of Materials Science and Engineering, Zhejiang University, Hangzhou, 310027, Peop. Rep. China). Materials Chemistry and Physics, 84(1), 171-181

(English) 2004. CODEN: MCHPDR. ISSN: 0254-0584. Publisher: Elsevier Science B.V..

AB The effect of Mn substitution for Ni on the structural and electrochem. properties of La0.7Mg0.3Ni3.4-xCo0.6Mnx (x = 0.0, 0.2, 0.3, 0.4, 0.5) H storage alloys, was studied. XRD showed that the alloys consist of (La,Mg)Ni3 and LaNi5 phases and that the lattice parameters and cell vols. of the component phases all increase with increasing x. P-C isotherms reveal that the H storage capacity increases to a max. and then decreases with increasing x, but the equil. H pressure decreases continuously with increasing x. Electrochem. studies show that the max. discharge capacity increases at first when x increases from 0.0 to 0.4 and then decreases when x reaches 0.5. The high-rate dischargeability of the alloy electrodes are all rather high, increasing from 72.9 (x = 0.0) to 83.8% (x = 0.3) and then decreasing to 78.9% (x = 0.5) at a discharge c.d. Id = 1000 mA/g. The results of electrochem. impedance spectroscopy, linear polarization, Tafel polarization, and **H** diffusion coeff. **measurements** all indicate that the exchange c.d., I0, the limiting c.d., IL, and the H diffusion coeff., D, of the alloy electrodes all increase at first and then decrease with increasing Mn content of the alloys. This implies that the electrochem. kinetics of these La0.7Mg0.3Ni3.4-xCo0.6Mnx H storage alloys has an optimum Mn content. This phenomenon is attributed to the good electrocatalytic activity of Ni at the surface and Mn substitution for Ni increases the Ni content at the surface of alloy electrodes for an appropriate level of Mn substitution.

IT **539836-35-6 681036-03-3 681036-04-4**
681036-05-5 681036-06-6
(electrochem. of La0.7Mg0.3Ni3.4-xCo0.6Mnx **anode** materials for nickel-metal hydride **batteries**)

RN 539836-35-6 HCA
CN Nickel alloy, base, Ni 59,La 29,Co 10,Mg 2.1 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	59	7440-02-0
La	29	7439-91-0
Co	10	7440-48-4
Mg	2.1	7439-95-4

RN 681036-03-3 HCA
CN Nickel alloy, base, Ni 55,La 29,Co 10,Mn 3.2,Mg 2.2 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number

Ni	55	7440-02-0
La	29	7439-91-0
Co	10	7440-48-4
Mn	3.2	7439-96-5
Mg	2.2	7439-95-4

RN 681036-04-4 HCA
CN Nickel alloy, base, Ni 54,La 29,Co 10,Mn 4.9,Mg 2.2 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	54	7440-02-0
La	29	7439-91-0
Co	10	7440-48-4
Mn	4.9	7439-96-5
Mg	2.2	7439-95-4

RN 681036-05-5 HCA
CN Nickel alloy, base, Ni 52,La 29,Co 10,Mn 6.5,Mg 2.2 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	52	7440-02-0
La	29	7439-91-0
Co	10	7440-48-4
Mn	6.5	7439-96-5
Mg	2.2	7439-95-4

RN 681036-06-6 HCA
CN Nickel alloy, base, Ni 50,La 29,Co 10,Mn 8.1,Mg 2.2 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	50	7440-02-0
La	29	7439-91-0
Co	10	7440-48-4
Mn	8.1	7439-96-5
Mg	2.2	7439-95-4

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56, **72**

ST cobalt lanthanum magnesium manganese nickel alloy **anode** hydride **battery**

IT **Battery anodes**
(electrochem. of La0.7Mg0.3Ni3.4-xCo0.6Mnx **anode** materials for nickel-metal hydride **batteries**)

IT **539836-35-6 681036-03-3 681036-04-4 681036-05-5 681036-06-6**
(electrochem. of La0.7Mg0.3Ni3.4-xCo0.6Mnx **anode** materials for nickel-metal hydride **batteries**)

IT 1333-74-0, Hydrogen, processes
(hydrogen diffusion in La0.7Mg0.3Ni3.4-xCo0.6Mnx **anode** materials for nickel-metal hydride **batteries**)

L23 ANSWER 5 OF 10 HCA COPYRIGHT 2006 ACS on STN

139:294415 Study on the microstructure and the electrochemical properties of Ml0.7Mg0.2Ni2.8Co0.6 hydrogen storage alloy. Tang, Rui; Liu, Liqin; Liu, Yongning; Yu, Guang (School of Material Science and Engineering, State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University, Xi'an, 710049, Peop. Rep. China). International Journal of Hydrogen Energy, 28(8), 815-819 (English) 2003. CODEN: IJHEDX. ISSN: 0360-3199. Publisher: Elsevier Science Ltd..

AB A H storage alloy, Ml0.7Mg0.2Ni2.8Co0.6, was obtained by inductive melting of La-rich mischmetal and the other alloy elements. XRD, SEM and EDX analyses indicated that the microstructure of the prepd. alloy had a LaNi5 phase as matrix and La5Mg2Ni21 as a secondary phase. The highest **H** absorption **concn.** was 1.58% at 302 K through measurement of pressure-concn.-temp. curves. The discharge capacity was 380 mA-h/g which is 20% higher than that of the traditional LaNi5-type alloys. However, cycle stability needs to be improved for commercialization. The formation of a La5Mg2Ni21 secondary phase is the key factor in the high capacity of the alloy.

IT **608517-30-2**
(microstructure and electrochem. properties of Ml0.7Mg0.2Ni2.8Co0.6 hydrogen storage alloy **anodes** for nickel-metal hydride **batteries**)

RN 608517-30-2 HCA

CN Nickel alloy, base, Ni 54,La 32,Co 12,Mg 1.6 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	54	7440-02-0
La	32	7439-91-0
Co	12	7440-48-4
Mg	1.6	7439-95-4

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56
ST hydrogen storage cobalt magnesium mischmetal nickel alloy **anode battery**
IT **Battery anodes**
Secondary **batteries**
(microstructure and electrochem. properties of Ml0.7Mg0.2Ni2.8Co0.6 hydrogen storage alloy **anodes** for nickel-metal hydride **batteries**)
IT **608517-30-2**
(microstructure and electrochem. properties of Ml0.7Mg0.2Ni2.8Co0.6 hydrogen storage alloy **anodes** for nickel-metal hydride **batteries**)
IT 1333-74-0, Hydrogen, processes
(microstructure and electrochem. properties of Ml0.7Mg0.2Ni2.8Co0.6 hydrogen storage alloy **anodes** for nickel-metal hydride **batteries**)

L23 ANSWER 6 OF 10 HCA COPYRIGHT 2006 ACS on STN
138:389140 Hydrogen-absorbing magnesium alloy with high hydrogen absorption. Aoki, Masakazu; Ito, Kazuhiko; Towata, Shinichi; Mori, Toshihiro; Saito, Katsushi; Kaneko, Michiyo (Toyota Central Research and Development Laboratories, Inc., Japan; Toyota Motor Corp.). Jpn. Kokai Tokkyo Koho JP 2003147472 A2 20030521, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-338145 20011102.
AB The Mg alloy has a compn. represented by Mg1-(x+y)NixRy (R = Y, misch metal, rare earth metal; $0 < x < 0.3$; $0 < y < 0.1$), where the minor axis of Mg crystal phase and that of Mg2Ni crystal phase obsd. in cross section are both ≤5 μm. The Mg alloy absorbs and desorbs large **amt.** of **H** at high rate.
IT **525605-27-0P**
(H-absorbing Mg-Ni alloy with high H absorption/desorption rate)
RN 525605-27-0 HCA
CN Magnesium alloy, base, Mg 64,Ni 18,Nd 11,Y 6.9 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Mg	64	7439-95-4
Ni	18	7440-02-0
Nd	11	7440-00-8
Y	6.9	7440-65-5

IC ICM C22C023-00
CC 56-3 (Nonferrous Metals and Alloys)
IT 525605-23-6P 525605-24-7P 525605-25-8P 525605-26-9P

525605-27-0P
(H-absorbing Mg-Ni alloy with high H absorption/desorption rate)

L23 ANSWER 7 OF 10 HCA COPYRIGHT 2006 ACS on STN
136:56421 Nickel/hydrogen **battery**. Fukunaga, Hiroshi (Hitachi Maxell, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2001357872 A2 20011226, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-180823 20000616.
AB The **battery** has a separator between a Ni(OH)2 cathode rod and a tubular H absorbing alloy **anode**, where the **anode** surface area is 1.9-2.5 time the cathode surface area.
IT **383124-78-5**
(controlled hydrogen absorbing alloy **anode**/nickel hydroxide cathode surface area **ratio** in nickel/ **hydrogen batteries**)
RN 383124-78-5 HCA
CN Nickel alloy, base, Ni 55,La 22,Co 9.3,Nb 5.2,Ce 4.1,Mn 2.4,Al 2.1,Mg 0.2 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	55	7440-02-0
- La	22	7439-91-0
x Co	9.3	7440-48-4
Nb	5.2	7440-03-1
- Ce	4.1	7440-45-1
x Mn	2.4	7439-96-5
x Al	2.1	7429-90-5
Mg	0.2	7439-95-4

IC ICM H01M010-30
ICS H01M004-24; H01M004-32; H01M004-38; H01M004-52
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
ST nickel hydrogen **battery** electrode surface area ratio
IT Secondary **batteries**
(controlled hydrogen absorbing alloy **anode**/nickel hydroxide cathode surface area **ratio** in nickel/ **hydrogen batteries**)
IT 1333-74-0, Hydrogen, uses 12054-48-7, Nickel hydroxide [Ni(OH)2] **383124-78-5**
(controlled hydrogen absorbing alloy **anode**/nickel hydroxide cathode surface area **ratio** in nickel/ **hydrogen batteries**)

L23 ANSWER 8 OF 10 HCA COPYRIGHT 2006 ACS on STN
131:21331 Secondary nickel/hydrogen **batteries**. Yamamoto,

Masaaki; Hayashida, Hirotaka; Kitayama, Hiroshi; Inada, Shusuke; Sakai, Isao; Kono, Tatsuoki; Yoshida, Hideki; Inaba, Takamichi; Kanda, Motoki (Toshiba Corp., Japan). Jpn. Kokai Tokkyo Koho JP 11162505 A2 19990618 Heisei, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-329211 19971128.

AB The **batteries** have a H absorbing R1-xMgxNiyAz (R = Y contg. rare earth metals, Ca, Zr, and/or Ti; A = Co, Mn, Fe, V, Cr, Nb, Al, Ga, Zn, Sn, Cu, Si, P, and/or B; 0 <x <1; 0 ≤z ≤1.5; 2.5 ≤(y+z) ≤4.5) alloy **anode**, a Ni(OH)2 cathode, and a nonwoven separator contg. synthetic resin fibers; where the the wt. of the H absorbing alloy/unit **anode** area is ≤6 time the base wt. of the separator.

IT **226418-72-0 226420-46-8 226420-47-9**
(controlled **anode** filling rate/separator base wt. **ratio** for nickel/**hydrogen batteries** with nonwoven synthetic fiber separators)

RN 226418-72-0 HCA
CN Nickel alloy, base, Ni 52,La 35,Co 10,Mg 2.6 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	52	7440-02-0
La	35	7439-91-0
Co	10	7440-48-4
Mg	2.6	7439-95-4

RN 226420-46-8 HCA
CN Nickel alloy, base, Ni 57,La 24,Pr 15,Al 1.9,Mg 1.7 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	57	7440-02-0
La	24	7439-91-0
Pr	15	7440-10-0
Al	1.9	7429-90-5
Mg	1.7	7439-95-4

RN 226420-47-9 HCA
CN Nickel alloy, base, Ni 59,La 25,Nd 10,Mn 3.9,Mg 2.6 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	59	7440-02-0

La	25	7439-91-0
Nd	10	7440-00-8
Mn	3.9	7439-96-5
Mg	2.6	7439-95-4

IC ICM H01M010-30
ICS C22C019-00; H01M002-16; H01M004-24; H01M004-38
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
ST nickel hydrogen **battery anode** separator ratio
IT Polyolefin fibers
(acrylic acid grafted or sulfonated; controlled **anode** filling rate/separator base wt. **ratio** for nickel/ **hydrogen batteries** with nonwoven synthetic fiber separators)
IT **Battery anodes**
Secondary **batteries**
Secondary **battery** separators
(controlled **anode** filling rate/separator base wt. **ratio** for nickel/**hydrogen batteries** with nonwoven synthetic fiber separators)
IT 1333-74-0, Hydrogen, uses **226418-72-0 226420-46-8 226420-47-9**
(controlled **anode** filling rate/separator base wt. **ratio** for nickel/**hydrogen batteries** with nonwoven synthetic fiber separators)

L23 ANSWER 9 OF 10 HCA COPYRIGHT 2006 ACS on STN
131:21329 Secondary nickel/hydrogen **batteries**. Kitayama, Hiroshi; Hayashida, Hirotaka; Yamamoto, Masaaki; Sakai, kaoru; Kono, Tatsuoki; Yoshida, Hideki; Inaba, Takamichi; Inada, Shusuke; Kanda, Motoki (Toshiba Corp., Japan). Jpn. Kokai Tokkyo Koho JP 11162503 A2 19990618 Heisei, 15 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-329214 19971128.
AB The **batteries** have a H absorbing R1-xMgxNiyAz (R = Y contg. rare earth metals, Ca, Zr, and/or Ti; A = Co, Mn, Fe, V, Cr, Nb, Al, Ga, Zn, Sn, Cu, Si, P, and/or B; 0 <x <1; 0 ≤z ≤1.5; 2.5 ≤(y+z) ≤4.5) alloy **anode**, a cathode, and an alk. electrolyte; where the **anode** contains the alloy at a wt. X = 3.2-5.0 g/A.h theor. cathode capacity, and the electrolyte has a vol. of 0.9 to (0.2X + 0.7) mL.
IT **226418-72-0**
(controlled electrode and electrolyte **ratios** in nickel/ **hydrogen batteries**)
RN 226418-72-0 HCA
CN Nickel alloy, base, Ni 52,La 35,Co 10,Mg 2.6 (9CI) (CA INDEX NAME)

Component Component Component

	Percent	Registry Number
Ni	52	7440-02-0
La	35	7439-91-0
Co	10	7440-48-4
Mg	2.6	7439-95-4

IC ICM H01M010-30
ICS C22C019-00; H01M004-24; H01M004-38
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
ST nickel **hydrogen battery** electrode **ratio** ; electrolyte nickel hydrogen **battery**
IT **Battery** electrodes
Battery electrolytes
Secondary **batteries**
(controlled electrode and electrolyte **ratios** in nickel/ **hydrogen batteries**)
IT 1310-58-3, Potassium hydroxide, uses 1310-65-2, Lithium hydroxide 1310-73-2, Sodium hydroxide, uses 1333-74-0, Hydrogen, uses 12054-48-7, Nickel hydroxide [Ni(OH)2] **226418-72-0**
(controlled electrode and electrolyte **ratios** in nickel/ **hydrogen batteries**)

L23 ANSWER 10 OF 10 HCA COPYRIGHT 2006 ACS on STN
95:206782 Lightweight hydrides for automotive storage of hydrogen. Rohy, D. A.; Nachman, J. F.; Argabright, T. A. (Solar Turbines Int., San Diego, CA, USA). Proceedings of the Intersociety Energy Conversion Engineering Conference, 16th(Vol. 2), 1444-8 (English) 1981. CODEN: PIECDE. ISSN: 0146-955X.
AB The development of Mg alloys for H storage is described and related to the requirements of the automotive spark ignition. The operating constraints of the engine include dissocn. temp., wt., dissocn. rate, cost, and storage d. of the hydride. Long-term cyclic tests simulating the refueling cycle were performed to assess the max. allowable impurities in H. The cycling effects on Mg0.845Ni0.05Cu0.1Y0.005 [**79771-89-4**] are reported. The **amt.** of absorbed **H** was greatly reduced after .apprx.2000 cycles owing to impurities such as O, N, CO, and H2O (32 ppm) in H.
IT **79771-89-4**
(absorbent for hydrogen, for traction, properties of lightwt., effect of gaseous impurities on)
RN 79771-89-4 HCA
CN Magnesium alloy, base, Mg 68,Cu 21,Ni 9.7,Y 1.5 (9CI) (CA INDEX NAME)

Component Component Component

	Percent	Registry Number
Mg	68	7439-95-4
Cu	21	7440-50-8
Ni	9.7	7440-02-0
Y	1.5	7440-65-5

CC **52-3** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56

IT 79771-88-3 **79771-89-4** 79771-90-7
(absorbent for hydrogen, for traction, properties of lightwt., effect of gaseous impurities on)

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L24        17495 S (L8 OR HYDROGEN# OR H2 OR H)(2A)(CAPACIT? OR VOL# OR VO
L25           28 S L5 AND L24
L26           25 S L25 NOT (L22 OR L23)
L27           25 S L26 AND (L6 OR L7 OR 52/SC,SX OR 72/SC,SX)
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L27 ANSWER 1 OF 25 HCA COPYRIGHT 2006 ACS on STN

145:66060 The structural, hydrogen storage and electrochemical properties of the La0.7Mg0.3Ni3.4-xCo0.6Mnx (x=0.0.apprx.0.5) hydrogen storage electrode alloys. Liu, Yongfeng; Pan, Hongge; Jin, Qinwei; Li, Rui; Ying, Tiao; Lei, Yongquan (Department of Materials Science and Engineering, Zhejiang University, Hangzhou, 310027, Peop. Rep. China). Xiyou Jinshu Cailiao Yu Gongcheng, 34(6), 867-871 (Chinese) 2005. CODEN: XJCGEA. ISSN: 1002-185X. Publisher: Kexue Chubanshe.

AB La0.7Mg0.3Ni3.4-xCo0.6Mnx (x = 0.0-0.5) H storage alloys consist of a (La,Mg)Ni3 phase and a LaNi5 phase. The lattice parameters and cell vols. of the component phases increase with increasing Mn content. P-C-T curves show that the equil. pressure for H desorption decreases from 1.28 atm (x = 0.0) to 0.67 atm (x = 0.5) and the **H** storage **capacity** increases from 1.19% (x = 0.0) to 1.38% (x = 0.4). The electrochem. studies show that the max. discharge capacity increases from 330.4 to 360.0 mA-h/g with x increasing from 0.0 to 0.4 and then decreases to 346.9 mA-h/g for x = 0.5. The HRD and the H diffusion coeff., D, of the alloy electrodes increases at first, then decrease with increasing Mn

content, but the charge-transfer reaction resistance, Rct, decreases at first and then increases. This implies that the electrochem. kinetics of the La0.7Mg0.3Ni3.4-xCo0.6Mnx H storage alloys increases at first and then decreases with increasing x from 0.0 to 0.5.

IT **539836-35-6 681036-03-3 681036-04-4**
681036-05-5 681036-06-6
(structural, hydrogen storage and electrochem. properties of La0.7Mg0.3Ni3.4-xCo0.6Mnx alloy **anodes** for **batteries**)

RN 539836-35-6 HCA
CN Nickel alloy, base, Ni 59,La 29,Co 10,Mg 2.1 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	59	7440-02-0
La	29	7439-91-0
Co	10	7440-48-4
Mg	2.1	7439-95-4

RN 681036-03-3 HCA
CN Nickel alloy, base, Ni 55,La 29,Co 10,Mn 3.2,Mg 2.2 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	55	7440-02-0
La	29	7439-91-0
Co	10	7440-48-4
Mn	3.2	7439-96-5
Mg	2.2	7439-95-4

RN 681036-04-4 HCA
CN Nickel alloy, base, Ni 54,La 29,Co 10,Mn 4.9,Mg 2.2 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	54	7440-02-0
La	29	7439-91-0
Co	10	7440-48-4
Mn	4.9	7439-96-5
Mg	2.2	7439-95-4

RN 681036-05-5 HCA
CN Nickel alloy, base, Ni 52,La 29,Co 10,Mn 6.5,Mg 2.2 (9CI) (CA INDEX

NAME)

Component	Component Percent	Component Registry Number
Ni	52	7440-02-0
La	29	7439-91-0
Co	10	7440-48-4
Mn	6.5	7439-96-5
Mg	2.2	7439-95-4

RN 681036-06-6 HCA
CN Nickel alloy, base, Ni 50,La 29,Co 10,Mn 8.1,Mg 2.2 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	50	7440-02-0
La	29	7439-91-0
Co	10	7440-48-4
Mn	8.1	7439-96-5
Mg	2.2	7439-95-4

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
ST hydrogen storage cobalt lanthanum magnesium manganese nickel alloy **anode**
IT **Battery anodes**
(structural, hydrogen storage and electrochem. properties of La0.7Mg0.3Ni3.4-xCo0.6Mnx alloy **anodes** for **batteries**)
IT **539836-35-6 681036-03-3 681036-04-4 681036-05-5 681036-06-6**
(structural, hydrogen storage and electrochem. properties of La0.7Mg0.3Ni3.4-xCo0.6Mnx alloy **anodes** for **batteries**)
IT 1333-74-0, Hydrogen, uses
(structural, hydrogen storage and electrochem. properties of La0.7Mg0.3Ni3.4-xCo0.6Mnx alloy **anodes** for **batteries**)

L27 ANSWER 2 OF 25 HCA COPYRIGHT 2006 ACS on STN
145:11222 Structure and electrochemical properties of La0.8-xRExMg0.2Ni3.2Co0.6 hydrogen storage alloys. Tang, Rui; Liu, Li-qin; Liu, Yong-ning; Yu, Guang; Zhu, Jie-wu; Liu, Xiao-dong (State Key Laboratory for Mechanical Behavior of Materials, Xi'an Jiaotong University, Xi'an, 710049, Peop. Rep. China). Zhongguo

Youse Jinshu Xuebao, 15(7), 1057-1061 (Chinese) 2005. CODEN: ZYJXFK. ISSN: 1004-0609. Publisher: Kexue Chubanshe.

AB $La_{0.8-x}RE_xMg_{0.2}Ni_{3.2}Co_{0.6}$ (RE=Sm, Dy, $0 \le x \le 0.3$) alloys were prepd. by inductive melting. The crystal structure of the alloys was detd. by X-ray powder diffractometry and the electrochem. properties were investigated. The results show that the alloys are composed of $LaNi_5$ as matrix and $LaNi_3$ as secondary phase. With the increasing Sm (Dy) substitution for La, the unit cell vol. of matrix of the alloys shrinks linearly and both the **hydrogen** storage **capacity** and discharge capacity decrease. When the Sm (Dy) substitution (x value) is 0.1, 0.2 and 0.3, the discharge capacity decreases from 380 mA h/g to 370(362), 355(334) and 329(295) mA h/g, resp. The rate performance and cycle stability is improved. After 100 cycles, the capacity loss decreases from 20% to 18% (17%), 16% (14%) and 13% (11%).

IT **888328-70-9P 888328-71-0P 888328-72-1P**
888328-73-2P 888328-74-3P 888328-75-4P
888328-76-5P
(structure and electrochem. properties of $La_{0.8-x}RE_xMg_{0.2}Ni_{3.2}Co_{0.6}$ hydrogen storage alloys)

RN 888328-70-9 HCA
CN Nickel alloy, base, Ni 55,La 28,Co 10,Dy 4.8,Mg 1.4 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	55	7440-02-0
La	28	7439-91-0
Co	10	7440-48-4
Dy	4.8	7429-91-6
Mg	1.4	7439-95-4

RN 888328-71-0 HCA
CN Nickel alloy, base, Ni 55,La 29,Co 10,Sm 4.4,Mg 1.4 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	55	7440-02-0
La	29	7439-91-0
Co	10	7440-48-4
Sm	4.4	7440-19-9
Mg	1.4	7439-95-4

RN 888328-72-1 HCA
CN Nickel alloy, base, Ni 55,La 24,Co 10,Sm 8.8,Mg 1.4 (9CI) (CA INDEX

NAME)

Component	Component Percent	Component Registry Number
Ni	55	7440-02-0
La	24	7439-91-0
Co	10	7440-48-4
Sm	8.8	7440-19-9
Mg	1.4	7439-95-4

RN 888328-73-2 HCA
CN Nickel alloy, base, Ni 55,La 24,Co 10,Dy 9.4,Mg 1.4 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	55	7440-02-0
La	24	7439-91-0
Co	10	7440-48-4
Dy	9.4	7429-91-6
Mg	1.4	7439-95-4

RN 888328-74-3 HCA
CN Nickel alloy, base, Ni 54,La 20,Dy 14,Co 10,Mg 1.4 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	54	7440-02-0
La	20	7439-91-0
Dy	14	7429-91-6
Co	10	7440-48-4
Mg	1.4	7439-95-4

RN 888328-75-4 HCA
CN Nickel alloy, base, Ni 55,La 20,Sm 13,Co 10,Mg 1.4 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	55	7440-02-0
La	20	7439-91-0
Sm	13	7440-19-9
Co	10	7440-48-4

Mg	1.4	7439-95-4

RN 888328-76-5 HCA
CN Nickel alloy, base, Ni 55,La 33,Co 10,Mg 1.4 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	55	7440-02-0
La	33	7439-91-0
Co	10	7440-48-4
Mg	1.4	7439-95-4

CC **52-3** (Electrochemical, Radiational, and Thermal Energy Technology)
IT **Battery** electrodes
Crystal structure
Electric discharge
(structure and electrochem. properties of La0.8-xRExMg0.2Ni3.2Co0.6 hydrogen storage alloys)
IT **888328-70-9P 888328-71-0P 888328-72-1P 888328-73-2P 888328-74-3P 888328-75-4P 888328-76-5P**
(structure and electrochem. properties of La0.8-xRExMg0.2Ni3.2Co0.6 hydrogen storage alloys)

L27 ANSWER 3 OF 25 HCA
144:353619 Crystallographic and electrochemical characteristics of La0.7Mg0.3Ni5.5-x(Al0.5Mo0.5)x (x = 0 to 0.8) hydrogen storage alloys. Zhang, X. B.; Sun, D. Z.; Yin, W. Y.; Chai, Y. J.; Zhao, M. S. (Key Laboratory of Rare Earth Chemistry and Physics, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun, 130022, Peop. Rep. China). Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science, 36A(8), 2025-2030 (English) 2005. CODEN: MMTAEB. ISSN: 1073-5623. Publisher: Minerals, Metals & Materials Society.
AB The structure, hydrogen storage property, and electrochem. characteristics of the La0.7Mg0.3Ni5.5-x(Al0.5Mo0.5)x (x = 0, 0.2, 0.4, 0.6, 0.8) hydrogen storage alloys were investigated systematically. It was found by x-ray powder diffraction and Rietveld anal. that the alloys are multiphase and consist of impurity Ni phase and two main crystallog. phases, namely, the La(La,Mg)2Ni9 phase and the LaNi5 phase, and the lattice parameters and the cell vols. of both the La(La,Mg)2Ni9 phase and the LaNi5 phase increase with increasing Al and Mo content in the alloys. The P-C isotherm curves indicated that the **hydrogen** storage **capacity** of the alloy first increases and then decreases with increasing x, and the equil. pressure decreases with increasing

x. The electrochem. measurements show that the max. discharge capacity first increases from 298.5 (x = 0) to 328.3 mAh/g (x = 0.6) and then decreases to 304.7 mAh/g (x = 0.8). The high rate dischargeability (HRD) of the alloy electrodes increases lineally from 65.4% (x = 0) to 86.6% (x = 0.8) at the discharge c.d. of 1200 mA/g. Moreover, the exchange c.d. of the alloy electrodes also increases monotonously with increasing x by the linear polarization curves. The hydrogen diffusion coeff. in the alloy bulk, D, increases with increasing Al and Mo content and thus enhances the low-temp. dischargeability (LTD) of the alloy electrodes.

IT **881176-02-9 881176-03-0 881176-04-1**
881176-05-2
(crystallog. and electrochem. characteristics of La0.7Mg0.3Ni5.5-x(Al0.5Mo0.5)x (x = 0 to 0.8) hydrogen storage alloys)

RN 881176-02-9 HCA
CN Nickel alloy, base, Ni 73,La 23,Mo 2.2,Mg 1.7,Al 0.6 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	73	7440-02-0
La	23	7439-91-0
Mo	2.2	7439-98-7
Mg	1.7	7439-95-4
Al	0.6	7429-90-5

RN 881176-03-0 HCA
CN Nickel alloy, base, Ni 70,La 23,Mo 4.5,Mg 1.7,Al 1.3 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	70	7440-02-0
La	23	7439-91-0
Mo	4.5	7439-98-7
Mg	1.7	7439-95-4
Al	1.3	7429-90-5

RN 881176-04-1 HCA
CN Nickel alloy, base, Ni 67,La 23,Mo 6.7,Al 1.9,Mg 1.7 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number

Ni	67	7440-02-0
La	23	7439-91-0
Mo	6.7	7439-98-7
Al	1.9	7429-90-5
Mg	1.7	7439-95-4

RN 881176-05-2 HCA
CN Nickel alloy, base, Ni 64,La 23,Mo 8.9,Al 2.5,Mg 1.7 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	64	7440-02-0
La	23	7439-91-0
Mo	8.9	7439-98-7
Al	2.5	7429-90-5
Mg	1.7	7439-95-4

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56
IT 881176-01-8 **881176-02-9 881176-03-0**
881176-04-1 881176-05-2
(crystallog. and electrochem. characteristics of La0.7Mg0.3Ni5.5-x(Al0.5Mo0.5)x (x = 0 to 0.8) hydrogen storage alloys)

L27 ANSWER 4 OF 25 HCA COPYRIGHT 2006 ACS on STN
144:111131 Crystal structures of La-Mg-Nix (x = 3-4) system hydrogen storage alloys. Hayakawa, Hiroshi; Akiba, Etsuo; Gotoh, Midori; Kohno, Tatsuoki (National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, 305-8565, Japan). Materials Transactions, 46(6), 1393-1401 (English) 2005. CODEN: MTARCE. ISSN: 1345-9678. Publisher: Japan Institute of Metals.
AB Alloys of the La-Mg-Ni (Ni/(La+Mg) = 3-4) system absorb and desorb H at room temp. and their **H** storage **capacities** are greater than those of conventional AB5-type alloys. The crystal structures of La0.7Mg0.3Ni2.5Co0.5 (alloy T1) and La0.75Mg0.25Ni3.0Co0.5 (alloy T2) were studied with ICP, SEM-EDX and XRD. Alloy T1 consisted of Ce2Ni7-type La3Mg(Ni,Co)14 and PuNi3-type La2Mg(Ni,Co)9 phases, and alloy T2 consisted of Ce2Ni7-type La3Mg(Ni,Co)14 and Pr5Co19-type La4Mg(Ni,Co)19 phases. These alloy systems had layered structures and showed polytypism that originated from differences in the stacking patterns of the units, which are composed of several [CaCu5]-type layers and a single [MgZn2]-type layer along the c-axis. The crystal structure of La3Mg(Ni,Co)14 was of a hexagonal 2H-Ce2Ni7-type with a =

0.5052(1), and c = 2.4245(3) nm. La2Mg(Ni, Co)9 had a trigonal 3R-PuNi3-type structure with a = 0.5062(1), and c = 2.4500(2) nm. La4Mg(Ni, Co)19 had a hexagonal 2H-Pr5Co19-type structure with a = 0.5042(2) and c = 3.2232(5) nm. In all these structures, the La-La distance of the [CaCu5] layer was 0.38-0.40 nm and that of the [MgZn2] layer was 0.32 nm. Mg occupied the La site in the [MgZn2] layer. Selective occupation by Mg of the La site in the [MgZn2] layer makes the alloy stable for repeated reaction cycles with H. The alloy system that forms this material group can be described by the general formula Lan+1MgNi5n+4, with n = 0, 1, 2, 3, 4,.

IT **226418-72-0 308812-22-8**
(crystal structure of La-Mg-Nix system hydrogen storage alloy **anodes** for Ni-MH **batteries**)

RN 226418-72-0 HCA

CN Nickel alloy, base, Ni 52,La 35,Co 10,Mg 2.6 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	52	7440-02-0
La	35	7439-91-0
Co	10	7440-48-4
Mg	2.6	7439-95-4

RN 308812-22-8 HCA

CN Nickel alloy, base, Ni 56,La 33,Co 9.3,Mg 1.9 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	56	7440-02-0
La	33	7439-91-0
Co	9.3	7440-48-4
Mg	1.9	7439-95-4

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56, 75

ST hydrogen storage alloy cobalt lanthanum magnesium nickel crystal structure; cobalt lanthanum magnesium nickel alloy **anode** hydride batttery

IT **Battery anodes**
Crystal structure
(crystal structure of La-Mg-Nix system hydrogen storage alloy **anodes** for Ni-MH **batteries**)

IT **226418-72-0 308812-22-8**
(crystal structure of La-Mg-Nix system hydrogen storage alloy **anodes** for Ni-MH **batteries**)

IT 1333-74-0, Hydrogen, uses
(crystal structure of La-Mg-Nix system hydrogen storage alloy **anodes** for Ni-MH **batteries**)
IT 7429-90-5, Aluminum, occurrence 7439-91-0, Lanthanum, occurrence 7439-95-4, Magnesium, occurrence 7440-02-0, Nickel, occurrence 7440-48-4, Cobalt, occurrence
(in La-Mg-Nix system hydrogen storage alloy **anodes** for Ni-MH **batteries**)

L27 ANSWER 5 OF 25 HCA COPYRIGHT 2006 ACS on STN
143:424573 Crystallographic and electrochemical characteristics of La0.7Mg0.3Ni5.0-x(Al0.5Mo0.5)x hydrogen-storage alloys. Zhang, Xin Bo; Sun, Dan Zi; Yin, Wen Ya; Chai, Yu Jun; Zhao, Min Shou (Key Laboratory of Rare Earth Chemistry and Physics Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun, 130022, Peop. Rep. China). ChemPhysChem, 6(3), 520-525 (English) 2005. CODEN: CPCHFT. ISSN: 1439-4235. Publisher: Wiley-VCH Verlag GmbH & Co. KGaA.
AB The structure, hydrogen-storage property and electrochem. characteristics of La0.7Mg0.3Ni5.0-x(Al0.5Mo0.5)x (x = 0-0.8) hydrogen-storage alloys have been studied systematically. X-ray diffraction Rietveld anal. shows that all the alloys consist of an La (La,Mg)2Ni9 phase and an LaNi5 phase. The pressure-compn. isotherms indicate that the **hydrogen**-storage **capacity** first increases and then decreases with increasing x, and the equil. pressure decreases with increasing x. Electrochem. measurements show that the max. discharge capacity and the exchange-c.d. of the alloy electrodes increase as x increases from 0 to 0.6 and then decrease when x increases further from 0.6 to 0.8. Moreover, the low-temp. dischargeability of the alloy electrodes increases monotonically with increasing x in the alloys.
IT **868134-60-5P 868134-62-7P 868134-63-8P 868134-64-9P 868134-65-0P**
(crystallog. and electrochem. characteristics of La0.7Mg0.3Ni5.0-x(Al0.5Mo0.5)x hydrogen-storage alloys)
RN 868134-60-5 HCA
CN Nickel alloy, base, Ni 62-74,La 24,Mo 0-9.6,Al 0-2.7,Mg 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	62 - 74	7440-02-0
La	24	7439-91-0
Mo	0 - 9.6	7439-98-7
Al	0 - 2.7	7429-90-5
Mg	1.8	7439-95-4

RN 868134-62-7 HCA
CN Nickel alloy, base, Ni 71,La 24,Mo 2.4,Mg 1.8,Al 0.7 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	71	7440-02-0
La	24	7439-91-0
Mo	2.4	7439-98-7
Mg	1.8	7439-95-4
Al	0.7	7429-90-5

RN 868134-63-8 HCA
CN Nickel alloy, base, Ni 65,La 24,Mo 7.2,Al 2,Mg 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	65	7440-02-0
La	24	7439-91-0
Mo	7.2	7439-98-7
Al	2	7429-90-5
Mg	1.8	7439-95-4

RN 868134-64-9 HCA
CN Nickel alloy, base, Ni 62,La 24,Mo 9.6,Al 2.7,Mg 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	62	7440-02-0
La	24	7439-91-0
Mo	9.6	7439-98-7
Al	2.7	7429-90-5
Mg	1.8	7439-95-4

RN 868134-65-0 HCA
CN Nickel alloy, base, Ni 68,La 24,Mo 4.8,Mg 1.8,Al 1.4 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	68	7440-02-0
La	24	7439-91-0

Mo	4.8	7439-98-7
Mg	1.8	7439-95-4
Al	1.4	7429-90-5

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56, 65, 75

ST Aluminum lanthanum magnesium molybdenum nickel hydrogen storage alloy; hydrogen storage alloy **battery** electrode cryst structure electrochem

IT **Battery** electrodes
(crystallog. and electrochem. characteristics of La0.7Mg0.3Ni5.0-x(Al0.5Mo0.5)x hydrogen-storage alloys)

IT 212263-15-5P **868134-60-5P 868134-62-7P 868134-63-8P 868134-64-9P 868134-65-0P**
(crystallog. and electrochem. characteristics of La0.7Mg0.3Ni5.0-x(Al0.5Mo0.5)x hydrogen-storage alloys)

L27 ANSWER 6 OF 25 HCA COPYRIGHT 2006 ACS on STN

143:408988 Crystal structure of hydrogen storage alloys, La-Mg-Nix(x=3-4) system. Hayakawa, Hiroshi; Akiba, Etsuo; Gotho, Midori; Kohno, Tatsuoki (Hydrogen Energy Group, Energy Technology Research Institute, National Institute of Advanced Science and Technology, Tsukuba, 305-8565, Japan). Nippon Kinzoku Gakkaishi, 69(1), 170-178 (Japanese) 2005. CODEN: NIKGAV. ISSN: 0021-4876. Publisher: Nippon Kinzoku Gakkai.

AB New alloys of La-Mg-Ni (Ni/(La + Mg) = 3-4) system absorb and desorb hydrogen at room temp., and the **hydrogen capacity** is higher than conventional AB5-type alloys. The crystal structures of La0.7Mg0.3Ni2.5Co0.5 (alloy T1) and La0.75Mg0.25Ni3.0Co0.5 (alloy T2) were investigated using ICP, SEM-EDX and XRD. We found that the alloy T1 consisted of Ce2Ni7-type La3Mg(Ni,Co)14 and PuNi3-type La2Mg(Ni,Co)9 phases and that the alloy T2 consisted of Ce2Ni7-type La3Mg(Ni,Co)14 and Pr5 Co19-type La4Mg(Ni,Co)19 phases. This alloy system has layered structure and shows polytypism that is originated from the difference in stacking of some [CaCu5]-type layers and one [MgZn2]-type layer along c-axis. Crystal structure of La3Mg(Ni,Co)14 is hexagonal 2H-Ce2Ni-type, a = 0.5052(1) nm, c = 2.4245(3) nm. La2Mg(Ni,Co)9 is trigonal 3R-PuNi3-type, a = 0.5062(1) nm, c = 2.4500(2) nm. La4Mg(Ni,Co)19 is 2H-Pr5Co19-type, a = 0.5042(2) nm, c = 3.2232(5) nm. In these all structure, the La-La distance in the [CaCu5] layer was 0.38-0.40 nm but that in the [MgZn2] layer was 0.32 nm. It was also found that Mg occupied the La site in the [MgZn2] layer. Selective occupation of Mg at the La site in the [MgZn2] layer makes the alloy stable in repeated reaction cycles with hydrogen. This alloy system has formed an agent group is described by the general formula Lan+1MgNi5n+4 where n = 0, 1, 2, 3, 4······.

IT **226418-72-0**, Cobalt 10, lanthanum 35, magnesium 2.6, nickel 52 **867379-22-4**, Cobalt 9.3, lanthanum 33, magnesium 2.3, nickel 56
(crystal structure of hydrogen storage alloys, La-Mg-Nix(x=3-4) system)

RN 226418-72-0 HCA
CN Nickel alloy, base, Ni 52,La 35,Co 10,Mg 2.6 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	52	7440-02-0
La	35	7439-91-0
Co	10	7440-48-4
Mg	2.6	7439-95-4

RN 867379-22-4 HCA
CN Nickel alloy, base, Ni 56,La 33,Co 9.3,Mg 2.3 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	56	7440-02-0
La	33	7439-91-0
Co	9.3	7440-48-4
Mg	2.3	7439-95-4

CC 56-8 (Nonferrous Metals and Alloys)
Section cross-reference(s): **52**, 75

IT **226418-72-0**, Cobalt 10, lanthanum 35, magnesium 2.6, nickel 52 **867379-22-4**, Cobalt 9.3, lanthanum 33, magnesium 2.3, nickel 56
(crystal structure of hydrogen storage alloys, La-Mg-Nix(x=3-4) system)

L27 ANSWER 7 OF 25 HCA COPYRIGHT 2006 ACS on STN

143:289354 Crystallographic and electrochemical characteristics of La0.7Mgo.3Ni4.5-x(Alo.5Mo0.5)x (x = 0-0.8) hydrogen storage alloys. Zhang, Xin-Bo; Sun, Dan-Zi; Yin, Wen-Ya; Chai, Yu-Jun; Zhao, Min-Shou (Key Laboratory of Rare Earth Chemistry and Physics, Changchun Institute of Applied Chemistry, Graduate School of Chinese Academy of Sciences, Chinese Academy of Sciences, Changchun, 130022, Peop. Rep. China). European Journal of Inorganic Chemistry (11), 2235-2241 (English) 2005. CODEN: EJICFO. ISSN: 1434-1948. Publisher: Wiley-VCH Verlag GmbH & Co. KGaA.

AB The structure, H storage property, and electrochem. characteristics of the La0.7Mg0.3Ni4.5-x(Al0.5Mo0.5)x (x = 0, 0.2, 0.4, 0.6, 0.8) H storage alloys were studied. XRD and Rietveld anal. reveal that all

the alloys mainly consist of a La(La, Mg)2Ni9 phase and a LaNi5 phase. The electrochem. measurements show that the max. discharge capacity increases 1st from 246.3 (x = 0) to 345.4 mA-h/g (x = 0.6) and then decreases to 317.6 mA-h/g (x = 0.8), which is consistent with the variation of the **H** storage **capacity** indicated by the P-C isotherms. For the discharge c.d. of 1200 mA/g, the high-rate dischargeability of the alloy electrodes increases linearly from 47.2% (x = 0) to 73.8% (x = 0.8). According to linear polarization curves the exchange c.d. of the alloy electrodes also increases monotonously with increasing x. The H diffusion coeff. increases with increasing Al and Mo content, and thus increases the low-temp. dischargeability of the alloy electrodes.

IT **864157-18-6P 864157-19-7P 864157-21-1P 864157-22-2P**
(crystallog. and electrochem. characteristics of La0.7Mgo.3Ni4.5-x(Alo.5Mo0.5)x hydrogen storage alloy **anodes** for Ni-MH **batteries**)

RN 864157-18-6 HCA
CN Nickel alloy, base, Ni 68,La 26,Mo 2.6,Mg 2,Al 0.7 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	68	7440-02-0
La	26	7439-91-0
Mo	2.6	7439-98-7
Mg	2	7439-95-4
Al	0.7	7429-90-5

RN 864157-19-7 HCA
CN Nickel alloy, base, Ni 65,La 26,Mo 5.2,Mg 2,Al 1.5 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	65	7440-02-0
La	26	7439-91-0
Mo	5.2	7439-98-7
Mg	2	7439-95-4
Al	1.5	7429-90-5

RN 864157-21-1 HCA
CN Nickel alloy, base, Ni 62,La 26,Mo 7.8,Al 2.2,Mg 2 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	62	7440-02-0
La	26	7439-91-0
Mo	7.8	7439-98-7
Al	2.2	7429-90-5
Mg	2	7439-95-4

RN 864157-22-2 HCA
CN Nickel alloy, base, Ni 59,La 26,Mo 10,Al 2.9,Mg 2 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	59	7440-02-0
La	26	7439-91-0
Mo	10	7439-98-7
Al	2.9	7429-90-5
Mg	2	7439-95-4

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56, 75
ST lanthanum magnesium nickel alloy **anode** crystallog metal hydride **battery**
IT **Battery anodes**
(crystallog. and electrochem. characteristics of La0.7Mgo.3Ni4.5-x(Alo.5Mo0.5)x hydrogen storage alloy **anodes** for Ni-MH **batteries**)
IT 864157-17-5P **864157-18-6P 864157-19-7P 864157-21-1P 864157-22-2P**
(crystallog. and electrochem. characteristics of La0.7Mgo.3Ni4.5-x(Alo.5Mo0.5)x hydrogen storage alloy **anodes** for Ni-MH **batteries**)
IT 1333-74-0, Hydrogen, uses
(crystallog. and electrochem. characteristics of La0.7Mgo.3Ni4.5-x(Alo.5Mo0.5)x hydrogen storage alloy **anodes** for Ni-MH **batteries**)
IT 7429-90-5, Aluminum, occurrence 7439-91-0, Lanthanum, occurrence 7439-95-4, Magnesium, occurrence 7439-98-7, Molybdenum, occurrence 7440-02-0, Nickel, occurrence
(in La0.7Mgo.3Ni4.5-x(Alo.5Mo0.5)x hydrogen storage alloy **anode** material for Ni-MH **batteries**)

L27 ANSWER 8 OF 25 HCA COPYRIGHT 2006 ACS on STN
143:250865 Preparation and electrode properties of NdMgNi4- xCox

hydrogen storage alloys. Zhang, Songli; Zhou, Huaiying; Wang, Zhongmin; Zou, R. P.; Xu, Huarui (Department of Information Materials Science and Engineering, Guilin University of Electronic Technology, Guilin, Guangxi, 541004, Peop. Rep. China). Journal of Alloys and Compounds, 398(1-2), 269-271 (English) 2005. CODEN: JALCEU. ISSN: 0925-8388. Publisher: Elsevier B.V..

AB Amorphous and cryst. hydrogen storage alloys NdMgNi4-xCox (x = 0.0, 0.2, 0.4, 0.6, 0.8, 1.0) were prepd. by mech. alloying and their electrode properties were studied systematically by a simulated **battery** test. The max. discharge capacity of the amorphous alloys was much higher than that of the cryst. ones, and the cycle life of the **neg. electrode** changed with x from 0.0 to 1.0, and esp. when x = 0.4, the alloy with the amorphous phase had the best cycle stability.

IT **863403-46-7P 863403-47-8P 863403-48-9P 863403-49-0P 863403-50-3P**
(prepn. and electrode properties of NdMgNi4- xCox hydrogen storage alloys)

RN 863403-46-7 HCA

CN Cobalt, compd. with magnesium, neodymium and nickel (0.2:1:1:3.8) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Co	0.2	7440-48-4
Ni	3.8	7440-02-0
Nd	1	7440-00-8
Mg	1	7439-95-4

RN 863403-47-8 HCA

CN Cobalt, compd. with magnesium, neodymium and nickel (0.4:1:1:3.6) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Co	0.4	7440-48-4
Ni	3.6	7440-02-0
Nd	1	7440-00-8
Mg	1	7439-95-4

RN 863403-48-9 HCA

CN Cobalt, compd. with magnesium, neodymium and nickel (0.6:1:1:3.4) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number

Co	0.6	7440-48-4
Ni	3.4	7440-02-0
Nd	1	7440-00-8
Mg	1	7439-95-4

RN 863403-49-0 HCA
CN Cobalt, compd. with magnesium, neodymium and nickel (0.8:1:1:3.2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Co	0.8	7440-48-4
Ni	3.2	7440-02-0
Nd	1	7440-00-8
Mg	1	7439-95-4

RN 863403-50-3 HCA
CN Cobalt, compd. with magnesium, neodymium and nickel (1:1:1:3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Co	1	7440-48-4
Ni	3	7440-02-0
Nd	1	7440-00-8
Mg	1	7439-95-4

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56, 76
ST **battery** electrode hydrogen storage alloy neodymium nickel magnesium cobalt; cycling stability discharge **capacity** amorphous cryst **hydrogen** storage alloy
IT **Battery** electrodes
Hydriding
(prepn. and electrode properties of NdMgNi4- xCox hydrogen storage alloys)
IT 483980-83-2P **863403-46-7P 863403-47-8P 863403-48-9P 863403-49-0P 863403-50-3P**
(prepn. and electrode properties of NdMgNi4- xCox hydrogen storage alloys)

L27 ANSWER 9 OF 25 HCA COPYRIGHT 2006 ACS on STN
143:156216 Crystallographic and electrochemical characteristics of hydrogen-absorbing alloy for secondary Ni-H **battery**

anode. Zhang, X. B.; Sun, D. Z.; Yin, W. Y.; Chai, Y. J.; Zhao, M. S. (Key Laboratory of Rare Earth Chemistry and Physics, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Graduate School of Chinese Academy of Sciences, Changchun, 130022, Peop. Rep. China). Electrochimica Acta, 50(16-17), 3407-3413 (English) 2005. CODEN: ELCAAV. ISSN: 0013-4686. Publisher: Elsevier B.V..

AB The effect of partial substitution of Al and Mo for Ni on the structure and electrochem. properties of the La0.7Mg0.3Ni3-x(Al0.5Mo0.5)x (x = 0-0.4) hydrogen storage alloys have been investigated systematically. The result of x-ray powder diffraction (XRD) and Rietveld anal. show that all the alloys consist of the La(La, Mg)2Ni9 phase and the LaNi5 phase. Meanwhile, the lattice parameter and the cell vol. of both the La(La, Mg)2Ni9 phase and the LaNi5 phase increase with increasing Al and Mo contents in the alloys. The pressure compn. isotherms curves indicate that the **hydrogen** storage **capacity** first increases and then decreases with increasing x. The electrochem. measurements show that the max. discharge capacity of the alloy electrodes first increases from 343.3 (x = 0) to 377.6 mAh/g (x = 0.3) and then decreases to 350.4 mAh/g (x = 0.4). Moreover, the high rate discharge ability (HRD) and the exchange c.d. of the alloy electrodes decrease first and then increases with the increase of x in the alloys. The hydrogen diffusion coeff. increases with increasing Al and Mo content and thus increases the low temp. discharge ability (LTD) of the alloy electrodes.

IT **859502-38-8 859502-39-9 859502-40-2 859502-41-3**
(crystallog. and electrochem. characteristics of hydrogen-absorbing alloys for secondary Ni-H **battery anodes**)

RN 859502-38-8 HCA
CN Nickel alloy, base, Ni 61,La 35,Mg 2.6,Mo 1.7,Al 0.5 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	61	7440-02-0
La	35	7439-91-0
Mg	2.6	7439-95-4
Mo	1.7	7439-98-7
Al	0.5	7429-90-5

RN 859502-39-9 HCA
CN Nickel alloy, base, Ni 58,La 35,Mo 3.4,Mg 2.6,Al 1 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	58	7440-02-0
La	35	7439-91-0
Mo	3.4	7439-98-7
Mg	2.6	7439-95-4
Al	1	7429-90-5

RN 859502-40-2 HCA
CN Nickel alloy, base, Ni 56,La 35,Mo 5.1,Mg 2.6,Al 1.4 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	56	7440-02-0
La	35	7439-91-0
Mo	5.1	7439-98-7
Mg	2.6	7439-95-4
Al	1.4	7429-90-5

RN 859502-41-3 HCA
CN Nickel alloy, base, Ni 54,La 35,Mo 6.8,Mg 2.6,Al 1.9 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	54	7440-02-0
La	35	7439-91-0
Mo	6.8	7439-98-7
Mg	2.6	7439-95-4
Al	1.9	7429-90-5

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
ST characteristic hydrogen absorbing alloy secondary **battery anode**
IT **Battery anodes**
(crystallog. and electrochem. characteristics of hydrogen-absorbing alloys for secondary Ni-H **battery anodes**)
IT 227623-67-8 **859502-38-8** **859502-39-9** **859502-40-2** **859502-41-3**
(crystallog. and electrochem. characteristics of hydrogen-absorbing alloys for secondary Ni-H **battery anodes**)

L27 ANSWER 10 OF 25 HCA COPYRIGHT 2006 ACS on STN
142:432970 Electrochemical properties of the ball-milled LaMg10Ni2-xAlx alloys with Ni powders (x = 0, 0.5, 1 and 1.5). Wang, Y.; Lu, Z. W.; Gao, X. P.; Hu, W. K.; Jiang, X. Y.; Qu, J. Q.; Shen, P. W. (Institute of New Energy Material Chemistry, Nankai University, Tianjin, 300071, Peop. Rep. China). Journal of Alloys and Compounds, 389(1-2), 290-295 (English) 2005. CODEN: JALCEU. ISSN: 0925-8388. Publisher: Elsevier B.V..

AB The structure and electrochem. H storage properties of ball-milled LaMg10Ni2 alloys with 50, 100 and 150% Ni powder were studied. The amt. of Ni addn. influenced the electrochem. properties. The amorphous (LaMg10Ni2 + 150 wt.% Ni) composite exhibited a high discharge capacity of 832 mA-h/g. The effect of partial substitution of Al for Ni in the LaMg10Ni2 alloys on the electrochem. properties was also studied. The amorphous-like (LaMg10NiAl + 150 wt.% Ni) composite exhibited the highest discharge capacity of 953 mA-h/g, corresponding to a **H** storage **capacity** of 3.56%. The Al substitution for Ni in the LaMg10Ni2 alloys had a pos. effect on the **H** storage **capacity**, but the cycling stability needs to be improved for them to be electrode materials. The reason why the ball-milled (LaMg10NiAl + 150 wt.% Ni) composite had the highest **H** storage **capacity** was analyzed by powder XRD and EIS. The existence of a 2nd phase (AlNi) in the LaMg10NiAl alloy probably plays an important role in the improvement of the catalytic activity and the electrochem. properties.

IT **850663-40-0 850663-41-1 850663-42-2**
(ball-milled with nickel; electrochem. properties of LaMg10Ni2-xAlx alloys ball-milled with Ni powder for **anodes** of Ni-MH **batteries**)

RN 850663-40-0 HCA
CN Magnesium alloy, base, Mg 50,La 29,Ni 18,Al 2.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Mg	50	7439-95-4
La	29	7439-91-0
Ni	18	7440-02-0
Al	2.8	7429-90-5

RN 850663-41-1 HCA
CN Magnesium alloy, base, Mg 52,La 30,Ni 13,Al 5.8 (9CI) (CA INDEX NAME)

Component Component Component

	Percent	Registry Number
Mg	52	7439-95-4
La	30	7439-91-0
Ni	13	7440-02-0
Al	5.8	7429-90-5

RN 850663-42-2 HCA
CN Magnesium alloy, base, Mg 54,La 31,Al 9,Ni 6.5 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Mg	54	7439-95-4
La	31	7439-91-0
Al	9	7429-90-5
Ni	6.5	7440-02-0

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56
ST aluminum lanthanum magnesium nickel alloy **anode** ball milling **battery**
IT Ball milling
Battery anodes
(electrochem. properties of LaMg10Ni2-xAlx alloys ball-milled with Ni powder for **anodes** of Ni-MH **batteries**)
IT 7440-02-0, Nickel, uses
(ball-milled with lanthanum magnesium nickel-based alloys; electrochem. properties of LaMg10Ni2-xAlx alloys ball-milled with Ni powder for **anodes** of Ni-MH **batteries**)
IT 850663-39-7 **850663-40-0 850663-41-1**
850663-42-2
(ball-milled with nickel; electrochem. properties of LaMg10Ni2-xAlx alloys ball-milled with Ni powder for **anodes** of Ni-MH **batteries**)

L27 ANSWER 11 OF 25 HCA COPYRIGHT 2006 ACS on STN
142:414306 Investigation on the characteristics of La0.7Mg0.3Ni2.65Mn0.1Co0.75+x (x = 0.00-0.85) metal hydride electrode alloys for Ni/MH **batteries**. Liu, Yongfeng; Pan, Hongge; Gao, Mingxia; Li, Rui; Sun, Xianzhong; Lei, Yongquan (Department of Materials Science and Engineering, Zhejiang University, Hangzhou, 310027, Peop. Rep. China). Journal of Alloys and Compounds, 387(1-2), 147-153 (English) 2005. CODEN: JALCEU. ISSN: 0925-8388. Publisher: Elsevier B.V..
AB Metal hydride alloys were prepd. from La0.7Mg0.3Ni2.65Mn0.1Co0.75 by

doping 0-19 at.% of Co into B-sites. Phase structures were obtained from XRD patterns and Rietveld analyses of each alloy. All alloys consisted mainly of the (La,Mg)Ni3 and the LaNi5 phases. With increasing Co addn., the unit cell vols. decrease and the relative abundance of the (La,Mg)Ni3 and LaNi5 phases changed. P-C-T curves were measured for La0.7Mg0.3Ni2.65Mn0.1Co0.75+x (x = 0.00-0.85) alloys at 303 K. The results indicate that the **H** absorption **capacity** decreases, the plateau pressure increases, hysteresis decreases and the plateau slope increases.

IT **769963-04-4 849540-37-0 849540-40-5**
849540-46-1 849540-49-4 850412-18-9
(characteristics of La0.7Mg0.3Ni2.65Mn0.1Co0.75+x alloy **anodes** for Ni-MH **batteries**)

RN 769963-04-4 HCA
CN Nickel alloy, base, Ni 50,La 31,Co 14,Mg 2.4,Mn 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	50	7440-02-0
La	31	7439-91-0
Co	14	7440-48-4
Mg	2.4	7439-95-4
Mn	1.8	7439-96-5

RN 849540-37-0 HCA
CN Nickel alloy, base, Ni 49,La 31,Co 17,Mg 2.3,Mn 1.7 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	49	7440-02-0
La	31	7439-91-0
Co	17	7440-48-4
Mg	2.3	7439-95-4
Mn	1.7	7439-96-5

RN 849540-40-5 HCA
CN Nickel alloy, base, Ni 48,La 30,Co 19,Mg 2.2,Mn 1.7 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	48	7440-02-0
La	30	7439-91-0

Co	19	7440-48-4
Mg	2.2	7439-95-4
Mn	1.7	7439-96-5

RN 849540-46-1 HCA
CN Nickel alloy, base, Ni 44,La 28,Co 24,Mg 2.1,Mn 1.6 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	44	7440-02-0
La	28	7439-91-0
Co	24	7440-48-4
Mg	2.1	7439-95-4
Mn	1.6	7439-96-5

RN 849540-49-4 HCA
CN Nickel alloy, base, Ni 43,La 27,Co 26,Mg 2,Mn 1.5 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	43	7440-02-0
La	27	7439-91-0
Co	26	7440-48-4
Mg	2	7439-95-4
Mn	1.5	7439-96-5

RN 850412-18-9 HCA
CN Nickel alloy, base, Ni 46,La 29,Co 22,Mg 2.1,Mn 1.6 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	46	7440-02-0
La	29	7439-91-0
Co	22	7440-48-4
Mg	2.1	7439-95-4
Mn	1.6	7439-96-5

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56
ST cobalt lanthanum magnesium manganese nickel alloy **anode battery**

IT **Battery anodes**
(characteristics of La0.7Mg0.3Ni2.65Mn0.1Co0.75+x alloy **anodes** for Ni-MH **batteries**)
IT Secondary **batteries**
(characteristics of La0.7Mg0.3Ni2.65Mn0.1Co0.75+x hydrogen storage **anodes** for Ni-MH **batteries**)
IT **769963-04-4 849540-37-0 849540-40-5 849540-46-1 849540-49-4 850412-18-9**
(characteristics of La0.7Mg0.3Ni2.65Mn0.1Co0.75+x alloy **anodes** for Ni-MH **batteries**)
IT 1333-74-0, Hydrogen, processes
(characteristics of La0.7Mg0.3Ni2.65Mn0.1Co0.75+x hydrogen storage **anodes** for Ni-MH **batteries**)

L27 ANSWER 12 OF 25 HCA COPYRIGHT 2006 ACS on STN
141:382079 Microstructure and hydrogen storage properties of a multi-phase Ml0.7Mg0.3Ni3.2 hydrogen storage alloy. Peng, C. H.; Zhu, M. (College of Mechanical Engineering, South China University of Technology, Guangzhou, 510640, Peop. Rep. China). Journal of Alloys and Compounds, 375(1-2), 324-329 (English) 2004. CODEN: JALCEU. ISSN: 0925-8388. Publisher: Elsevier Science B.V..
AB Ml0.7Mg0.3Ni3.2 (Ml denotes La-rich misch metal) H storage alloy with a multi-phase microstructure was prepd. by induction melting under pure Ar. SEM and XRD show that there are 3 phases in the alloy viz. (MlMg)Ni5, (MlMg)Ni3 and (MlMg)Ni2. The measurement of P-C-I curves reveal that the max. **H capacity** at room temp. is 1.7% at a 3.4 MPa H2 pressure. The alloy exhibits good absorption kinetics at room temp. Chem. plating of Ni-P on the alloy powder improves the electrochem. properties of the alloy. Electrochem. measurement showed that the highest discharge capacity of the annealed Ml0.7Mg0.3Ni3.2 alloy is 260 mA-h/g.
IT **784143-19-7**
(microstructure and hydrogen storage properties of multi-phase Ml0.7Mg0.3Ni3.2 hydrogen storage alloy)
RN 784143-19-7 HCA
CN Nickel alloy, base, Ni 64,La 18,Nd 10,Pr 5.7,Mg 2.5 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	64	7440-02-0
La	18	7439-91-0
Nd	10	7440-00-8
Pr	5.7	7440-10-0
Mg	2.5	7439-95-4

CC **52-3** (Electrochemical, Radiational, and Thermal Energy

Technology)
Section cross-reference(s): 56

IT 1333-74-0, Hydrogen, uses **784143-19-7**
(microstructure and hydrogen storage properties of multi-phase Ml0.7Mg0.3Ni3.2 hydrogen storage alloy)

L27 ANSWER 13 OF 25 HCA COPYRIGHT 2006 ACS on STN

141:382006 Effect of Co content on the structural and electrochemical properties of the La0.7Mg0.3Ni3.4-xMn0.1Cox hydride alloys. I. The structure and hydrogen storage. Liu, Yongfeng; Pan, Hongge; Gao, Mingxia; Li, Rui; Lei, Yongquan (Department of Materials Science and Engineering, Zhejiang University, Hangzhou, 310027, Peop. Rep. China). Journal of Alloys and Compounds, 376(1-2), 296-303 (English) 2004. CODEN: JALCEU. ISSN: 0925-8388. Publisher: Elsevier Science B.V..

AB Structural, H storage and electrochem. studies were performed on La0.7Mg0.3Ni3.4-xMn0.1Cox (x = 0.00, 0.30, 0.60, 0.75, 0.90, 1.05, 1.15, 1.30, 1.45, 1.60) H storage alloys. The phase structures were identified by XRD and Rietveld analyses showing that all alloys consist mainly of 2 phases: the (La,Mg)Ni3 phase with a rhombohedral PuNi3-type structure and the LaNi5 phase with a hexagonal CaCu5-type structure and a small amt. of LaNi phase. Both a and c parameters of the (La,Mg)Ni3 phase and the LaNi5 phase increase with increasing Co content and subsequent expansion of the cell vols. owing to the at. radius of Co (1.67 A) being somewhat larger than that of Ni (1.62 A). The relative abundance of the (La,Mg)Ni3 and LaNi5 phases also changed. P-C isotherms indicate that the equil. pressure for absorption/desorption of H decreases due to the expansion of the cell **vol.** and the **H** storage **capacity** 1st increases and then decreases with increasing x from 0.00 to 1.60. The absorption/desorption pressure hysteresis also decreases and the slope of the plateau increases with an increase in Co content.

IT **769963-01-1 769963-02-2 769963-03-3**
769963-04-4 769963-05-5 769963-06-6
769963-07-7 769963-08-8 769963-09-9
769963-10-2
(effect of Co content on properties of La0.7Mg0.3Ni3.4-xMn0.1Cox alloys as **anode** materials for Ni-metal hydride **batteries**)

RN 769963-01-1 HCA

CN Nickel alloy, base, Ni 64,La 31,Mg 2.4,Mn 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	64	7440-02-0
La	31	7439-91-0

Mg	2.4	7439-95-4
Mn	1.8	7439-96-5

RN 769963-02-2 HCA
CN Nickel alloy, base, Ni 59,La 31,Co 5.7,Mg 2.4,Mn 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	59	7440-02-0
La	31	7439-91-0
Co	5.7	7440-48-4
Mg	2.4	7439-95-4
Mn	1.8	7439-96-5

RN 769963-03-3 HCA
CN Nickel alloy, base, Ni 53,La 31,Co 11,Mg 2.4,Mn 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	53	7440-02-0
La	31	7439-91-0
Co	11	7440-48-4
Mg	2.4	7439-95-4
Mn	1.8	7439-96-5

RN 769963-04-4 HCA
CN Nickel alloy, base, Ni 50,La 31,Co 14,Mg 2.4,Mn 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	50	7440-02-0
La	31	7439-91-0
Co	14	7440-48-4
Mg	2.4	7439-95-4
Mn	1.8	7439-96-5

RN 769963-05-5 HCA
CN Nickel alloy, base, Ni 47,La 31,Co 17,Mg 2.4,Mn 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number

Ni	47	7440-02-0
La	31	7439-91-0
Co	17	7440-48-4
Mg	2.4	7439-95-4
Mn	1.8	7439-96-5

RN 769963-06-6 HCA
CN Nickel alloy, base, Ni 45,La 31,Co 20,Mg 2.4,Mn 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	45	7440-02-0
La	31	7439-91-0
Co	20	7440-48-4
Mg	2.4	7439-95-4
Mn	1.8	7439-96-5

RN 769963-07-7 HCA
CN Nickel alloy, base, Ni 43,La 31,Co 22,Mg 2.4,Mn 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	43	7440-02-0
La	31	7439-91-0
Co	22	7440-48-4
Mg	2.4	7439-95-4
Mn	1.8	7439-96-5

RN 769963-08-8 HCA
CN Nickel alloy, base, Ni 40,La 31,Co 25,Mg 2.4,Mn 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	40	7440-02-0
La	31	7439-91-0
Co	25	7440-48-4
Mg	2.4	7439-95-4
Mn	1.8	7439-96-5

RN 769963-09-9 HCA
CN Nickel alloy, base, Ni 37,La 31,Co 28,Mg 2.4,Mn 1.8 (9CI) (CA INDEX

NAME)

Component	Component Percent	Component Registry Number
Ni	37	7440-02-0
La	31	7439-91-0
Co	28	7440-48-4
Mg	2.4	7439-95-4
Mn	1.8	7439-96-5

RN 769963-10-2 HCA
CN Nickel alloy, base, Ni 34,La 31,Co 30,Mg 2.4,Mn 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	34	7440-02-0
La	31	7439-91-0
Co	30	7440-48-4
Mg	2.4	7439-95-4
Mn	1.8	7439-96-5

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56
ST cobalt lanthanum magnesium manganese nickel alloy **anode** hydride **battery**
IT **Battery anodes**
(effect of Co content on properties of La0.7Mg0.3Ni3.4-xMn0.1Cox alloys as **anode** materials for Ni-metal hydride **batteries**)
IT 7440-48-4, Cobalt, uses
(effect of Co content on properties of La0.7Mg0.3Ni3.4-xMn0.1Cox alloys as **anode** materials for Ni-metal hydride **batteries**)
IT **769963-01-1 769963-02-2 769963-03-3 769963-04-4 769963-05-5 769963-06-6 769963-07-7 769963-08-8 769963-09-9 769963-10-2**
(effect of Co content on properties of La0.7Mg0.3Ni3.4-xMn0.1Cox alloys as **anode** materials for Ni-metal hydride **batteries**)

L27 ANSWER 14 OF 25 HCA
141:382005 An electrochemical study of La0.4Ce0.3Mg0.3Ni2.975-xMnxCo0.525 (x = 0.1-0.4) hydrogen storage alloys. Pan, Hongge;

Jin, Qinwei; Gao, Mingxia; Liu, Yongfeng; Li, Rui; Lei, Yongquan; Wang, Qidong (Department of Materials Science and Engineering, Zhejiang University, Hangzhou, 310027, Peop. Rep. China). Journal of Alloys and Compounds, 376(1-2), 196-204 (English) 2004. CODEN: JALCEU. ISSN: 0925-8388. Publisher: Elsevier Science B.V..

AB In this paper, the structural and electrochem. properties of La0.4Ce0.3Mg0.3Ni2.975-xMnxCo0.525 (x = 0.1-0.4) hydrogen storage alloys have been studied systematically. It can be found by XRD Rietveld anal. that all these alloys mainly consist of two phases: the La(La, Mg)2Ni9 phase with the rhombohedral PuNi3-type structure and the LaNi5 phase with the hexagonal CaCu5-type structure. The XRD anal. results also reveal that with increasing manganese content in the alloys, the La(La, Mg)2Ni9 phase content decreases and the LaNi5 phase content increases and both the lattice parameters and the cell vol. of La(La, Mg)2Ni9 and LaNi5 phase increase. The P-C isotherms show that with increasing manganese content in the alloys the **hydrogen** storage **capacity** (**H**/M) changes very little and the plateau pressure for hydrogen absorption and desorption decreases evidently. The electrochem. studies show that the discharge capacity increases with increasing manganese content. The high rate dischargeability and the exchange c.d. I0, and the limiting c.d. IL of all alloy electrodes increase as x increases from 0.1 to 0.3 and then decrease when x increases further.

IT **781676-75-3 781676-76-4 781676-77-5**
781676-78-6
(electrochem. study of hydrogen storage alloys La0.4Ce0.3Mg0.3Ni2.975-xMnxCo0.525 (x = 0.1-0.4))

RN 781676-75-3 HCA
CN Nickel alloy, base, Ni 52,La 19,Ce 14,Co 11,Mg 2.5,Mn 1.9 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	52	7440-02-0
La	19	7439-91-0
Ce	14	7440-45-1
Co	11	7440-48-4
Mg	2.5	7439-95-4
Mn	1.9	7439-96-5

RN 781676-76-4 HCA
CN Nickel alloy, base, Ni 52,La 18,Ce 14,Co 10,Mn 3.6,Mg 2.4 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number

Ni	52	7440-02-0
La	18	7439-91-0
Ce	14	7440-45-1
Co	10	7440-48-4
Mn	3.6	7439-96-5
Mg	2.4	7439-95-4

RN 781676-77-5 HCA
CN Nickel alloy, base, Ni 52,La 18,Ce 13,Co 9.8,Mn 5.2,Mg 2.3 (9CI)
(CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	52	7440-02-0
La	18	7439-91-0
Ce	13	7440-45-1
Co	9.8	7440-48-4
Mn	5.2	7439-96-5
Mg	2.3	7439-95-4

RN 781676-78-6 HCA
CN Nickel alloy, base, Ni 52,La 17,Ce 13,Co 9.5,Mn 6.7,Mg 2.2 (9CI)
(CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	52	7440-02-0
La	17	7439-91-0
Ce	13	7440-45-1
Co	9.5	7440-48-4
Mn	6.7	7439-96-5
Mg	2.2	7439-95-4

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49, 56
IT Secondary **batteries**
(nickel-metal hydride, **anodes**; electrochem. study of hydrogen storage alloys La0.4Ce0.3Mg0.3Ni2.975-xMnxCo0.525 (x = 0.1-0.4))
IT **781676-75-3 781676-76-4 781676-77-5**
781676-78-6
(electrochem. study of hydrogen storage alloys La0.4Ce0.3Mg0.3Ni2.975-xMnxCo0.525 (x = 0.1-0.4))

L27 ANSWER 15 OF 25 HCA

141:382004 A study on the structure and electrochemical properties of La2Mg(Ni0.95M0.05)9 (M = Co, Mn, Fe, Al, Cu, Sn) hydrogen storage electrode alloys. Liao, B.; Lei, Y. Q.; Chen, L. X.; Lu, G. L.; Pan, H. G.; Wang, Q. D. (Department of Materials Science and Engineering, Zhejiang University, Hangzhou, 310027, Peop. Rep. China). Journal of Alloys and Compounds, 376(1-2), 186-195 (English) 2004. CODEN: JALCEU. ISSN: 0925-8388. Publisher: Elsevier Science B.V..

AB The effect of replacing part of the Ni by a metallic element in La2MgNi9 on the structure and electrochem. properties of the thus formed La2Mg(Ni0.95M0.05)9 quaternary alloys (M = Co, Mn, Fe, Al, Cu, Sn) was investigated. The substitutions did not change the main phase structure (the hexagonal PuNi3-type structure), but all increased the unit cell vol. of the alloys except the Sn substituted one, in which some LaNiSn second phase was formed. All hydrides of the alloys preserved the PuNi3-type structure, while the amorphization of a portion of the hydride of the Al substituted alloy was obsd. The substitution led to some decrease in **hydrogen capacity**, and an increase in hydride stability except for the Sn substituted one, and led to some decrease in both the discharge capacity and in the high-rate dischargeability (HRD), but led to a noticeable improvement in cycling stability for most of the substituted alloys (except for the Sn substituted one). The decrease of the high-rate dischargeability was due to the decrease of the electrocatalytic activity of the alloy electrodes and the lower diffusibility of hydrogen in the bulk of alloys as a result of the relatively low stability of the hydrides. The improvement in cycling stability was ascribed to the lower unit vol. change on hydriding and the formation of a corrosion resistant layer on the alloy surface.

IT **781672-23-9 781672-25-1 781672-27-3 781672-29-5 781672-31-9 781672-33-1**
(structure and electrochem. properties of hydrogen storage electrode alloys La2Mg(Ni0.95M0.05)9 (M = Co, Mn, Fe, Al, Cu, Sn))

RN 781672-23-9 HCA

CN Nickel alloy, base, Ni 60,La 33,Co 3.2,Mg 2.9 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	60	7440-02-0
La	33	7439-91-0
Co	3.2	7440-48-4
Mg	2.9	7439-95-4

RN 781672-25-1 HCA

CN Nickel alloy, base, Ni 61,La 34,Mn 3,Mg 2.9 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	61	7440-02-0
La	34	7439-91-0
Mn	3	7439-96-5
Mg	2.9	7439-95-4

RN 781672-27-3 HCA
CN Nickel alloy, base, Ni 61,La 34,Fe 3,Mg 2.9 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	61	7440-02-0
La	34	7439-91-0
Fe	3	7439-89-6
Mg	2.9	7439-95-4

RN 781672-29-5 HCA
CN Nickel alloy, base, Ni 61,La 34,Mg 3,Al 1.5 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	61	7440-02-0
La	34	7439-91-0
Mg	3	7439-95-4
Al	1.5	7429-90-5

RN 781672-31-9 HCA
CN Nickel alloy, base, Ni 60,La 33,Cu 3.4,Mg 2.9 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	60	7440-02-0
La	33	7439-91-0
Cu	3.4	7440-50-8
Mg	2.9	7439-95-4

RN 781672-33-1 HCA
CN Nickel alloy, base, Ni 59,La 32,Sn 6.2,Mg 2.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number

Ni	59	7440-02-0
La	32	7439-91-0
Sn	6.2	7440-31-5
Mg	2.8	7439-95-4

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49, 55, 56

IT Secondary **batteries**
(nickel-metal hydride, **anodes**; structure and electrochem. properties of hydrogen storage electrode alloys La2Mg(Ni0.95M0.05)9 (M = Co, Mn, Fe, Al, Cu, Sn))

IT **781672-23-9** 781672-24-0 **781672-25-1**
781672-26-2 **781672-27-3** 781672-28-4, Iron lanthanum magnesium nickel hydride (Fe0.45La2MgNi8.55H11.1)
781672-29-5 781672-30-8 **781672-31-9**
781672-32-0 **781672-33-1** 781672-35-3, Lanthanum magnesium nickel tin hydride (La2MgNi8.55Sn0.45H10.7)
(structure and electrochem. properties of hydrogen storage electrode alloys La2Mg(Ni0.95M0.05)9 (M = Co, Mn, Fe, Al, Cu, Sn))

L27 ANSWER 16 OF 25 HCA COPYRIGHT 2006 ACS on STN

141:143158 Study on a low-cobalt Ml0.8Mg0.2Ni3.2Co0.3Al0.3 alloy. Tang, Rui; Zhang, Zhaohui; Liu, Liqin; Liu, Yongning; Zhu, Jiewu; Yu, Guang (School Material Science and Engineering, State Key Laboratory for Mechanical Behavior of Materials, Xian Jiaotong University, Xian, 710049, Peop. Rep. China). International Journal of Hydrogen Energy, 29(8), 851-858 (English) 2004. CODEN: IJHEDX. ISSN: 0360-3199. Publisher: Elsevier Science Ltd..

AB A low-Co Ml0.8Mg0.2Ni3.2Co0.3Al0.3 alloy (Ml = lanthanum-rich mischmetal) was prepd. and studied by examg. the alloy structure, phase compn., hydrogen absorption/desorption and electrochem. properties. The alloy is composed of Mg-free LaNi5 phase as matrix and Mg-contained LaNi3 phase as secondary phase. The **hydrogen** storage **capacity** (1.37%) at 298 °K, discharge **capacity** (320 mA **h**/g) and cycling stability (88% of the initial capacity remained after 300 charge/discharge cycles) of the alloy are as good as those of the com. MmNi3.55Co0.75Mn0.4Al0.3 alloy. However, the high-rate discharge ability is better than that of the com. alloy. The Mn-free compn. is advantageous to the oxidization-resistant performance of the alloy. The secondary phase is tougher than the matrix, which not only contributes to the high-rate discharge ability, but also improves the fracture ductility and depresses the disintegration during charge/discharge cycle.

IT **727651-29-8**

(secondary phase in Ml0.8Mg0.2Ni3.2Co0.3Al0.3; low-cobalt Ml0.8Mg0.2Ni3.2Co0.3Al0.3 alloy as hydrogen storage **battery** cathode)
RN 727651-29-8 HCA
CN Nickel alloy, base, Ni 59,La 20,Pr 9.8,Mg 4.5,Co 3.8,Al 2.3 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	59	7440-02-0
La	20	7439-91-0
Pr	9.8	7440-10-0
Mg	4.5	7439-95-4
Co	3.8	7440-48-4
Al	2.3	7429-90-5

CC **52-3** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56, **72**, 75, 76
ST lanthanum misch metal nickel alloy secondary **battery** cathode hydriding
IT Surface damage
(crazing; low-cobalt Ml0.8Mg0.2Ni3.2Co0.3Al0.3 alloy as hydrogen storage **battery** cathode)
IT Current density
(effect on high-rate discharge ability and overpotential; low-cobalt Ml0.8Mg0.2Ni3.2Co0.3Al0.3 alloy as hydrogen storage **battery** cathode)
IT Secondary **batteries**
(hydride; low-cobalt Ml0.8Mg0.2Ni3.2Co0.3Al0.3 alloy as hydrogen storage **battery** cathode)
IT **Battery** cathodes
Cathodic polarization
Ductility
Fracture toughness
Overvoltage
(low-cobalt Ml0.8Mg0.2Ni3.2Co0.3Al0.3 alloy as hydrogen storage **battery** cathode)
IT Electric energy
(potential and cycle nos. vs. discharge capacity of alloys; low-cobalt Ml0.8Mg0.2Ni3.2Co0.3Al0.3 alloy as hydrogen storage **battery** cathode)
IT Crazing
(surface; low-cobalt Ml0.8Mg0.2Ni3.2Co0.3Al0.3 alloy as hydrogen storage **battery** cathode)
IT 1333-74-0, Hydrogen, processes
(absorption/desorption of; low-cobalt Ml0.8Mg0.2Ni3.2Co0.3Al0.3

alloy as hydrogen storage **battery** cathode)
IT 181147-99-9P 727651-27-6P
(cathode material; low-cobalt Ml0.8Mg0.2Ni3.2Co0.3Al0.3 alloy as hydrogen storage **battery** cathode)
IT 1310-58-3, Potassium hydroxide, uses
(low-cobalt Ml0.8Mg0.2Ni3.2Co0.3Al0.3 alloy as hydrogen storage **battery** cathode)
IT 12054-48-7, Nickel hydroxide (Ni(OH)2)
(low-cobalt Ml0.8Mg0.2Ni3.2Co0.3Al0.3 alloy as hydrogen storage **battery** cathode)
IT 727651-28-7
(majority matrix phase in Ml0.8Mg0.2Ni3.2Co0.3Al0.3; low-cobalt Ml0.8Mg0.2Ni3.2Co0.3Al0.3 alloy as hydrogen storage **battery** cathode)
IT 7440-02-0, Nickel, uses
(porous foam, electrode support; low-cobalt Ml0.8Mg0.2Ni3.2Co0.3Al0.3 alloy as hydrogen storage **battery** cathode)
IT **727651-29-8**
(secondary phase in Ml0.8Mg0.2Ni3.2Co0.3Al0.3; low-cobalt Ml0.8Mg0.2Ni3.2Co0.3Al0.3 alloy as hydrogen storage **battery** cathode)

L27 ANSWER 17 OF 25 HCA COPYRIGHT 2006 ACS on STN
141:74143 Influence of Mn content on the structural and electrochemical properties of the La0.7Mg0.3Ni4.25-xCo0.75Mnx hydrogen storage alloys. Liu, Yongfeng; Pan, Hongge; Zhu, Yunfeng; Li, Rui; Lei, Yongquan (Department of Materials Science and Engineering, Zhejiang University, Hangzhou, 310027, Peop. Rep. China). Materials Science & Engineering, A: Structural Materials: Properties, Microstructure and Processing, A372(1-2), 163-172 (English) 2004. CODEN: MSAPE3. ISSN: 0921-5093. Publisher: Elsevier Science B.V..
AB The effect of Mn content on the structure and electrochem. properties of La0.7Mg0.3Ni4.25-xCo0.75Mnx (x = 0, 0.1, 0.2, 0.3, 0.4, 0.5) H storage alloys was studied. XRD showed that the alloys consist mainly of (La,Mg)Ni3 and LaNi5 phases. The lattice parameters and unit cell vols. of these 2 phases increase with increasing x. P-C-T curves reveal that the plateau pressure decreases progressively and the **H** storage **capacity** increases at first and then decreases with an increase in Mn content. Electrochem. studies showed that the max. discharge capacity and the high-rate dischargeability of the alloy electrodes increased with increasing x. Electrochem. impedance spectroscopy, linear polarization, **anodic** polarization and potential-step measurements, showed that the exchange c.d., the limiting c.d., and the H diffusion coeff. all 1st increase and then decrease with increasing x from 0 to 0.5. Considering the global effect of Mn substitution for Ni on the overall performance of the

La0.7Mg0.3Ni4.25-xCo0.75Mnx alloy electrodes, the optimum compn. is at x = 0.4.

IT **539836-39-0 709640-65-3 709640-66-4 709640-67-5 709640-68-6 709640-69-7**
(influence of Mn_content on properties of La0.7Mg0.3Ni4.25-xCo0.75Mnx hydrogen storage **anodes** for nickel-metal hydride **batteries**)

RN 539836-39-0 HCA
CN Nickel alloy, base, Ni 63,La 24,Co 11,Mg 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	63	7440-02-0
La	24	7439-91-0
Co	11	7440-48-4
Mg	1.8	7439-95-4

RN 709640-65-3 HCA
CN Nickel alloy, base, Ni 61,La 24,Co 11,Mg 1.8,Mn 1.4 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	61	7440-02-0
La	24	7439-91-0
Co	11	7440-48-4
Mg	1.8	7439-95-4
Mn	1.4	7439-96-5

RN 709640-66-4 HCA
CN Nickel alloy, base, Ni 60,La 24,Co 11,Mn 2.8,Mg 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	60	7440-02-0
La	24	7439-91-0
Co	11	7440-48-4
Mn	2.8	7439-96-5
Mg	1.8	7439-95-4

RN 709640-67-5 HCA
CN Nickel alloy, base, Ni 58,La 24,Co 11,Mn 4.2,Mg 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	58	7440-02-0
La	24	7439-91-0
Co	11	7440-48-4
Mn	4.2	7439-96-5
Mg	1.8	7439-95-4

RN 709640-68-6 HCA
CN Nickel alloy, base, Ni 57,La 25,Co 11,Mn 5.5,Mg 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	57	7440-02-0
La	25	7439-91-0
Co	11	7440-48-4
Mn	5.5	7439-96-5
Mg	1.8	7439-95-4

RN 709640-69-7 HCA
CN Nickel alloy, base, Ni 56,La 25,Co 11,Mn 6.9,Mg 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	56	7440-02-0
La	25	7439-91-0
Co	11	7440-48-4
Mn	6.9	7439-96-5
Mg	1.8	7439-95-4

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56
ST cobalt lanthanum magnesium manganese nickel alloy **anode battery**
IT **Battery anodes**
(influence of Mn_content on properties of La0.7Mg0.3Ni4.25-xCo0.75Mnx hydrogen storage **anodes** for nickel-metal hydride **batteries**)
IT Secondary **batteries**
(nickel-metal hydride; influence of Mn_content on properties of La0.7Mg0.3Ni4.25-xCo0.75Mnx hydrogen storage **anodes** for nickel-metal hydride **batteries**)

IT **539836-39-0 709640-65-3 709640-66-4**
709640-67-5 709640-68-6 709640-69-7
(influence of Mn_content on properties of La0.7Mg0.3Ni4.25-xCo0.75Mnx hydrogen storage **anodes** for nickel-metal hydride **batteries**)

IT 1333-74-0, Hydrogen, processes
(influence of Mn_content on properties of La0.7Mg0.3Ni4.25-xCo0.75Mnx hydrogen storage **anodes** for nickel-metal hydride **batteries**)

L27 ANSWER 18 OF 25 HCA COPYRIGHT 2006 ACS on STN
140:360176 Structural and Electrochemical Properties of the La0.7Mg0.3Ni2.975-xCo0.525Mnx Hydrogen Storage Electrode Alloys. Pan, Hongge; Liu, Yongfeng; Gao, Mingxia; Zhu, Yunfeng; Lei, Yongquan; Wang, Qidong (Department of Materials Science and Engineering, Zhejiang University, Hangzhou, 310027, Peop. Rep. China). Journal of the Electrochemical Society, 151(3), A374-A380 (English) 2004. CODEN: JESOAN. ISSN: 0013-4651. Publisher: Electrochemical Society.

AB The effect of partial substitution of Mn for Ni on the structural and electrochem. properties of the La0.7Mg0.3Ni2.975-xCo0.525Mnx (x = 0.0, 0.1, 0.2, 0.3, 0.4, 0.5) hydrogen storage alloys was studied systematically. The results of x-ray powder diffraction and Rietveld analyses showed that all alloys consisted of the (La, Mg)Ni3 phase and the LaNi5 phase, and the content of the (La, Mg)Ni3 phase 1st remained unchanged (.apprx.77%) and then decreased, but the content of the LaNi5 phase increased progressively with increasing x. Meanwhile, the lattice parameters and cell vols. of the (La, Mg)Ni3 phase and the LaNi5 phase all increased with increasing Mn content. The pressure compn. isotherms showed that the **hydrogen** storage **capacity** 1st remained almost unchanged and then decreased with increasing x from 0.0 to 0.5, and the equil. pressure decreased from 0.51 atm to 0.06 atm. The electrochem. measurements indicated that the max. discharge capacity 1st remains unchanged (.apprx.400 mAh/g) with increasing x from 0.0 to 0.2 and then decreased when x increased further. Also, the high rate discharge-ability, the exchange c.d. I0, the limiting c.d. IL, and the hydrogen diffusion coeff. D of the alloy electrodes all increased 1st and then decreased with increasing x, which indicates that the kinetics of hydriding/dehydriding of the La0.7Mg0.3Ni2.975-xCo0.525Mnx (x = 0.0, 0.1, 0.2, 0.3, 0.4, 0.5) hydrogen storage alloys increased 1st up to x = 0.1 and then decreased with further increasing x.

IT **610796-26-4P 671235-23-7P 682809-10-5P**
682809-11-6P 682809-12-7P 682809-13-8P
(structural and electrochem. properties of La0.7Mg0.3Ni2.975-xCo0.525Mnx hydrogen storage electrode alloys)

RN 610796-26-4 HCA

CN Nickel alloy, base, Ni 56,La 31,Co 10,Mg 2.4 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	56	7440-02-0
La	31	7439-91-0
Co	10	7440-48-4
Mg	2.4	7439-95-4

RN 671235-23-7 HCA
CN Nickel alloy, base, Ni 54,La 31,Co 10,Mg 2.4,Mn 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	54	7440-02-0
La	31	7439-91-0
Co	10	7440-48-4
Mg	2.4	7439-95-4
Mn	1.8	7439-96-5

RN 682809-10-5 HCA
CN Nickel alloy, base, Ni 55,La 33,Co 10,Mg 2.4 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	55	7440-02-0
La	33	7439-91-0
Co	10	7440-48-4
Mg	2.4	7439-95-4

RN 682809-11-6 HCA
CN Nickel alloy, base, Ni 51,La 31,Co 10,Mn 5.3,Mg 2.4 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	51	7440-02-0
La	31	7439-91-0
Co	10	7440-48-4
Mn	5.3	7439-96-5
Mg	2.4	7439-95-4

RN 682809-12-7 HCA

CN Nickel alloy, base, Ni 49,La 32,Co 10,Mn 7.1,Mg 2.4 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	49	7440-02-0
La	32	7439-91-0
Co	10	7440-48-4
Mn	7.1	7439-96-5
Mg	2.4	7439-95-4

RN 682809-13-8 HCA
CN Nickel alloy, base, Ni 47,La 32,Co 10,Mn 8.9,Mg 2.4 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	47	7440-02-0
La	32	7439-91-0
Co	10	7440-48-4
Mn	8.9	7439-96-5
Mg	2.4	7439-95-4

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **72**, 75, 76
ST electrochem cobalt lanthanum magnesium nickel hydrogen storage alloy; secondary **battery anode** polarization impedance hydriding lattice parameter capacitance
IT Electric impedance
(of assembled **batteries**; structural and electrochem. properties of La0.7Mg0.3Ni2.975-xCo0.525Mnx hydrogen storage electrode alloys)
IT **Anodic** polarization
Battery anodes
Hydriding kinetics
Secondary **batteries**
(structural and electrochem. properties of La0.7Mg0.3Ni2.975-xCo0.525Mnx hydrogen storage electrode alloys)
IT 1333-74-0, Hydrogen, reactions
(storage and diffusion through **anodes**; structural and electrochem. properties of La0.7Mg0.3Ni2.975-xCo0.525Mnx hydrogen storage electrode alloys)
IT **610796-26-4P 671235-23-7P 682809-10-5P 682809-11-6P 682809-12-7P 682809-13-8P**
(structural and electrochem. properties of La0.7Mg0.3Ni2.975-

xCo0.525Mnx hydrogen storage electrode alloys)

L27 ANSWER 19 OF 25 HCA COPYRIGHT 2006 ACS on STN
140:220613 Structure and hydrogen storage properties of the rare-earth Mg-based hydrogen storage electrode alloys. Liu, Yongfeng; Ying, Tiao; Pan, Hongge (Department of Materials Science and Engineering, Zhejiang University, Hangzhou, 310027, Peop. Rep. China). Cailiao Yanjiu Xuebao, 17(4), 380-388 (Chinese) 2003. CODEN: CYXUEV. ISSN: 1005-3093. Publisher: Cailiao Yanjiu Xuebao Bianjibu.

AB The structure and absorption/desorption properties of the La0.7Mg0.3(Ni0.85Co0.15)x (x = 2.5, 3.0, 3.5, 4.0, 4.5, 5.0) H storage electrode alloys were studied. All the alloys consisted of a (La,Mg)Ni3 phase as well as a LaNi5 phase, and their a-axes and the unit cell vols. decrease with increasing x. The (La,Mg)Ni3 phase content increases from 48.4% at x = 2.5 to 78.2% at x = 3.5 and then it decreases to 12.2% at x = 5.0. The LaNi5 phase content initially remains unchanged at .apprx.20% and then it increases to 71.9% with increasing x up to 4.0. The **H** storage **capacity** increases from 0.86% (x = 2.5) to 1.50% (x = 3.5) and then it decreases to 1.19% (x = 5.0) with increasing x. The plateau becomes flatter, the plateau pressure remains almost unchanged and then it increases with increasing x from 2.5 to 5.0. The hysteresis of the P-C isotherms increases initially and then decreases with increasing x.

IT **539836-29-8 539836-31-2 539836-33-4 539836-35-6 539836-37-8 539836-39-0**
(structure and hydrogen storage properties of cobalt lanthanum magnesium nickel alloy **anodes** for nickel-metal hydride **batteries**)

RN 539836-29-8 HCA
CN Nickel alloy, base, Ni 50,La 39,Co 8.9,Mg 2.9 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	50	7440-02-0
La	39	7439-91-0
Co	8.9	7440-48-4
Mg	2.9	7439-95-4

RN 539836-31-2 HCA
CN Nickel alloy, base, Ni 53,La 35,Co 9.4,Mg 2.6 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	53	7440-02-0
La	35	7439-91-0

Co	9.4	7440-48-4
Mg	2.6	7439-95-4

RN 539836-33-4 HCA
CN Nickel alloy, base, Ni 56,La 31,Co 9.9,Mg 2.4 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	56	7440-02-0
La	31	7439-91-0
Co	9.9	7440-48-4
Mg	2.4	7439-95-4

RN 539836-35-6 HCA
CN Nickel alloy, base, Ni 59,La 29,Co 10,Mg 2.1 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	59	7440-02-0
La	29	7439-91-0
Co	10	7440-48-4
Mg	2.1	7439-95-4

RN 539836-37-8 HCA
CN Nickel alloy, base, Ni 61,La 26,Co 11,Mg 2 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	61	7440-02-0
La	26	7439-91-0
Co	11	7440-48-4
Mg	2	7439-95-4

RN 539836-39-0 HCA
CN Nickel alloy, base, Ni 63,La 24,Co 11,Mg 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	63	7440-02-0
La	24	7439-91-0
Co	11	7440-48-4
Mg	1.8	7439-95-4

CC **52-2** (Electrochemical, Radiational, and Thermal Energy

Technology)
Section cross-reference(s): 56

ST cobalt lanthanum magnesium nickel **anode** hydrogen storage alloy **battery**

IT **Battery anodes**
(structure and hydrogen storage properties of cobalt lanthanum magnesium nickel alloy **anodes** for nickel-metal hydride **batteries**)

IT 1333-74-0, Hydrogen, processes
(structure and hydrogen storage properties of cobalt lanthanum magnesium nickel alloy **anodes** for nickel-metal hydride **batteries**)

IT **539836-29-8 539836-31-2 539836-33-4 539836-35-6 539836-37-8 539836-39-0**
(structure and hydrogen storage properties of cobalt lanthanum magnesium nickel alloy **anodes** for nickel-metal hydride **batteries**)

L27 ANSWER 20 OF 25 HCA

140:184672 Hydrogen storage and electrochemical properties of the La0.7Mg0.3Ni3.825-xCo0.675Mnx hydrogen storage electrode alloys. Liu, Yongfeng; Pan, Hongge; Gao, Mingxia; Zhu, Yunfeng; Lei, Yongquan (Department of Materials Science and Engineering, Zhejiang University, Hangzhou, 310027, Peop. Rep. China). Journal of Alloys and Compounds, 365(1-2), 246-252 (English) 2004. CODEN: JALCEU. ISSN: 0925-8388. Publisher: Elsevier Science B.V..

AB The structure, H storage and electrochem. properties of La0.7Mg0.3Ni3.825-xCo0.675Mnx (x = 0.0, 0.1, 0.2, 0.3, 0.4, 0.5) H storage alloys were studied. According to XRD and Rietveld anal., all alloys consist mainly of 2 phases: an (La,Mg)Ni3 phase with the rhombohedral PuNi3-type structure and an LaNi5 phase with the hexagonal CaCu5-type structure. With increasing x, the abundance of the (La,Mg)Ni3 phase decreases, but the abundance of the LaNi5 phase increases progressively, which indicates that Mn is beneficial for the formation of the LaNi5 phase in the alloy. The pressure-compn. (P-C) isotherm curves reveal that the equil. pressure decreases and the **H** storage **capacity** increases 1st and then decreases with increasing x. Electrochem. studies show that the max. discharge capacity of the alloy electrodes increases from 225.2 to 328.8 mA-h/g and then decreases to 292.2 mA-h/g with increasing x from 0.0 to 0.5. The high rate dischargeability of the alloy electrodes also improved with an optimum Mn content at x = 0.4. The exchange c.d. I0, the limiting c.d. IL and the H diffusion coeff. D of the alloy electrodes all increase at first and then decrease with increasing x.

IT **539836-37-8**
(properties of La0.7Mg0.3Ni3.825Co0.675hydrogen storage alloy **anodes** for nickel-metal hydride **batteries**)

RN 539836-37-8 HCA
CN Nickel alloy, base, Ni 61,La 26,Co 11,Mg 2 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	61	7440-02-0
La	26	7439-91-0
Co	11	7440-48-4
Mg	2	7439-95-4

IT **658066-88-7 658066-91-2 658066-93-4**
658066-95-6 658066-97-8
(properties of La0.7Mg0.3Ni3.825-xCo0.675Mnx hydrogen storage alloy **anodes** for nickel-metal hydride **batteries**
)
RN 658066-88-7 HCA
CN Nickel alloy, base, Ni 59,La 26,Co 11,Mg 2,Mn 1.5 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	59	7440-02-0
La	26	7439-91-0
Co	11	7440-48-4
Mg	2	7439-95-4
Mn	1.5	7439-96-5

RN 658066-91-2 HCA
CN Nickel alloy, base, Ni 58,La 26,Co 11,Mn 3,Mg 2 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	58	7440-02-0
La	26	7439-91-0
Co	11	7440-48-4
Mn	3	7439-96-5
Mg	2	7439-95-4

RN 658066-93-4 HCA
CN Nickel alloy, base, Ni 56,La 26,Co 11,Mn 4.5,Mg 2 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number

Ni	56	7440-02-0
La	26	7439-91-0
Co	11	7440-48-4
Mn	4.5	7439-96-5
Mg	2	7439-95-4

RN 658066-95-6 HCA
CN Nickel alloy, base, Ni 55,La 26,Co 11,Mn 6,Mg 2 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	55	7440-02-0
La	26	7439-91-0
Co	11	7440-48-4
Mn	6	7439-96-5
Mg	2	7439-95-4

RN 658066-97-8 HCA
CN Nickel alloy, base, Ni 53,La 26,Co 11,Mn 7.5,Mg 2 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	53	7440-02-0
La	26	7439-91-0
Co	11	7440-48-4
Mn	7.5	7439-96-5
Mg	2	7439-95-4

CC **52-3** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56
ST hydrogen storage nickel alloy **anode** nickel metal hydride **battery**
IT **539836-37-8**
(properties of La0.7Mg0.3Ni3.825Co0.675hydrogen storage alloy **anodes** for nickel-metal hydride **batteries**)
IT 1333-74-0, Hydrogen, processes
(properties of La0.7Mg0.3Ni3.825-xCo0.675Mnx hydrogen storage alloy **anodes** for nickel-metal hydride **batteries**
)
IT **658066-88-7 658066-91-2 658066-93-4**
658066-95-6 658066-97-8
(properties of La0.7Mg0.3Ni3.825-xCo0.675Mnx hydrogen storage

alloy **anodes** for nickel-metal hydride **batteries**
)

L27 ANSWER 21 OF 25 HCA COPYRIGHT 2006 ACS on STN
140:184567 The effect of Mn substitution for Ni on the structural and electrochemical properties of La0.7Mg0.3Ni2.55-xCo0.45Mnx hydrogen storage electrode alloys. Liu, Yongfeng; Pan, Hongge; Gao, Mingxia; Zhu, Yunfeng; Lei, Yongquan; Wang, Qidong (Department of Materials Science and Engineering, Zhejiang University, Hangzhou, 310027, Peop. Rep. China). International Journal of Hydrogen Energy, Volume Date 2004, 29(3), 297-305 (English) 2003. CODEN: IJHEDX. ISSN: 0360-3199. Publisher: Elsevier Science Ltd..

AB The structure, H storage property and electrochem. properties of La0.7Mg0.3Ni2.55-xCo0.45Mnx (x = 0.0,0.1,0.2,0.3,0.4,0.5) **anode** alloys was studied systematically. XRD indicated that the alloys consisted of a (La,Mg)Ni3 phase and a LaNi5 phase. The lattice parameters and cell vols. of both the (La,Mg)Ni3 phase and the LaNi5 phase increase with increasing Mn content in alloys. The P-C isotherms curves indicate that the **H** storage **capacity** 1st increases and then decreases with increasing x, and the equil. pressure decreases. Electrochem. measurements show that the max. discharge capacity increases from 342.6 (x = 0.0) to 368.9 mA-h/g (x = 0.3) and then decreases to 333.5 mA-h/g (x = 0.5). For a discharge c.d. of 1000 mA/g, the high rate dischargeability of the alloy electrodes increases from 55.8% (x = 0.0) to 72.3% (x = 0.4) and then decreases to 70.0% (x = 0.5). Electrochem. impedance spectroscopy, linear polarization, and **anodic** polarization measurements show that the exchange c.d., I0, and the limiting c.d., IL, of the alloy electrodes also increases 1st and then decrease with increasing Mn content of the alloys.

IT **539836-31-2 658051-45-7 658051-46-8**
658051-47-9 658051-48-0 658051-49-1
(effect of Mn substitution for Ni on structural and electrochem. properties of La0.7Mg0.3Ni2.55-xCo0.45Mnx hydrogen storage **anodes** for Ni-metal hydride **batteries**)

RN 539836-31-2 HCA
CN Nickel alloy, base, Ni 53,La 35,Co 9.4,Mg 2.6 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	53	7440-02-0
La	35	7439-91-0
Co	9.4	7440-48-4
Mg	2.6	7439-95-4

RN 658051-45-7 HCA
CN Nickel alloy, base, Ni 51,La 35,Co 9.5,Mg 2.6,Mn 2 (9CI) (CA INDEX

NAME)

Component	Component Percent	Component Registry Number
Ni	51	7440-02-0
La	35	7439-91-0
Co	9.5	7440-48-4
Mg	2.6	7439-95-4
Mn	2	7439-96-5

RN 658051-46-8 HCA
CN Nickel alloy, base, Ni 49,La 35,Co 9.5,Mn 3.9,Mg 2.6 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	49	7440-02-0
La	35	7439-91-0
Co	9.5	7440-48-4
Mn	3.9	7439-96-5
Mg	2.6	7439-95-4

RN 658051-47-9 HCA
CN Nickel alloy, base, Ni 47,La 35,Co 9.5,Mn 5.9,Mg 2.6 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	47	7440-02-0
La	35	7439-91-0
Co	9.5	7440-48-4
Mn	5.9	7439-96-5
Mg	2.6	7439-95-4

RN 658051-48-0 HCA
CN Nickel alloy, base, Ni 45,La 35,Co 9.5,Mn 7.9,Mg 2.6 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	45	7440-02-0
La	35	7439-91-0
Co	9.5	7440-48-4
Mn	7.9	7439-96-5

Mg	2.6	7439-95-4

RN 658051-49-1 HCA
CN Nickel alloy, base, Ni 43,La 35,Mn 9.8,Co 9.5,Mg 2.6 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	43	7440-02-0
La	35	7439-91-0
Mn	9.8	7439-96-5
Co	9.5	7440-48-4
Mg	2.6	7439-95-4

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56, **72**
ST cobalt lanthanum magnesium manganese nickel alloy **anode** hydrogen **battery**
IT **Battery anodes**
(effect of Mn substitution for Ni on structural and electrochem. properties of La0.7Mg0.3Ni2.55-xCo0.45Mnx hydrogen storage **anodes** for Ni-metal hydride **batteries**)
IT 1333-74-0, Hydrogen, processes
(effect of Mn substitution for Ni on structural and electrochem. properties of La0.7Mg0.3Ni2.55-xCo0.45Mnx hydrogen storage **anodes** for Ni-metal hydride **batteries**)
IT **539836-31-2 658051-45-7 658051-46-8 658051-47-9 658051-48-0 658051-49-1**
(effect of Mn substitution for Ni on structural and electrochem. properties of La0.7Mg0.3Ni2.55-xCo0.45Mnx hydrogen storage **anodes** for Ni-metal hydride **batteries**)

L27 ANSWER 22 OF 25 HCA COPYRIGHT 2006 ACS on STN
139:263250 Investigation on the structure and electrochemical properties of the rare-earth Mg-based hydrogen storage electrode alloys. Liu, Yongfeng; Pan, Hongge; Gao, Mingxia; Zhu, Yunfeng; Ge, Hongwei; Li, Shouquan; Lei, Yongquan (Department of Materials Science and Engineering, Zhejiang University, Hangzhou, 310027, Peop. Rep. China). Jinshu Xuebao, 39(6), 666-672 (Chinese) 2003. CODEN: CHSPA4. ISSN: 0412-1961. Publisher: Kexue Chubanshe.
AB XRD Rietveld analyses show that La0.7Mg0.3(Ni0.85Co0.15)x (x = 2.5, 3.0, 3.5, 4.0, 4.5, 5.0) alloys consist of a (La,Mg)Ni3 phase and a LaNi5 phase. The (La,Mg)Ni3 phase component increases from 48.4% for x = 2.5 to 78.2% for x = 3.5, it then decreases to 12.2% for x = 5.0. The LaNi5 phase content remains unchanged at .apprx.20% with x increasing from 2.5 to 3.5, but then increases to 71.9% with x

increasing to 4.0. The **H** storage **capacity** increases 1st and then decreases with increasing x, the plateau becomes flatter and the plateau pressure 1st remains almost unchanged and then increases with increasing x from 2.5 to 5.0. The electrochem. results show that the max. discharge capacity of an alloy electrode increase from 228.3 mA-h/g for x = 2.5 to 395.6 mA-h/g for x = 3.5, but then decrease to 226.8 mA-h/g for x = 5.0. The high-rate dischargeability increases and then decreases with increasing x from 2.5 to 4.5. The electrochem. reaction kinetics of the alloy electrodes increases 1st to a max. and then decreases with increasing x.

IT **539836-29-8 539836-31-2 539836-33-4 539836-35-6 539836-37-8 539836-39-0**
(structure and electrochem. properties of rare-earth Mg-based hydrogen storage electrode alloys)

RN 539836-29-8 HCA
CN Nickel alloy, base, Ni 50,La 39,Co 8.9,Mg 2.9 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	50	7440-02-0
La	39	7439-91-0
Co	8.9	7440-48-4
Mg	2.9	7439-95-4

RN 539836-31-2 HCA
CN Nickel alloy, base, Ni 53,La 35,Co 9.4,Mg 2.6 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	53	7440-02-0
La	35	7439-91-0
Co	9.4	7440-48-4
Mg	2.6	7439-95-4

RN 539836-33-4 HCA
CN Nickel alloy, base, Ni 56,La 31,Co 9.9,Mg 2.4 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	56	7440-02-0
La	31	7439-91-0
Co	9.9	7440-48-4
Mg	2.4	7439-95-4

RN 539836-35-6 HCA
CN Nickel alloy, base, Ni 59,La 29,Co 10,Mg 2.1 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	59	7440-02-0
La	29	7439-91-0
Co	10	7440-48-4
Mg	2.1	7439-95-4

RN 539836-37-8 HCA
CN Nickel alloy, base, Ni 61,La 26,Co 11,Mg 2 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	61	7440-02-0
La	26	7439-91-0
Co	11	7440-48-4
Mg	2	7439-95-4

RN 539836-39-0 HCA
CN Nickel alloy, base, Ni 63,La 24,Co 11,Mg 1.8 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	63	7440-02-0
La	24	7439-91-0
Co	11	7440-48-4
Mg	1.8	7439-95-4

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56, **72**
ST cobalt lanthanum magnesium nickel alloy hydrogen storage electrode **battery**
IT **Battery anodes**
(structure and electrochem. properties of rare-earth Mg-based hydrogen storage electrode alloys)
IT **539836-29-8 539836-31-2 539836-33-4**
539836-35-6 539836-37-8 539836-39-0
(structure and electrochem. properties of rare-earth Mg-based hydrogen storage electrode alloys)

L27 ANSWER 23 OF 25 HCA
138:356164 An investigation on the structural and electrochemical

properties of La0.7Mg0.3(Ni0.85Co0.15)x (x=3.15-3.80) hydrogen storage electrode alloys. Pan, Hongge; Liu, Yongfeng; Gao, Mingxia; Zhu, Yunfeng; Lei, Yongquan; Wang, Qidong (Department of Materials Science and Engineering, Zhejiang University, Hangzhou, 310027, Peop. Rep. China). Journal of Alloys and Compounds, 351(1-2), 228-234 (English) 2003. CODEN: JALCEU. ISSN: 0925-8388. Publisher: Elsevier Science B.V..

AB In this paper, the structural and electrochem. properties of the La0.7Mg0.3(Ni0.85Co0.15)x (x=3.15, 3.30, 3.50, 3.65, 3.80) hydrogen storage electrode alloys have been studied systematically. From the XRD analyses, each alloy of this series is composed of the LaNi3 phase and the LaNi5 phase, and the phase abundance of each phase varies with the degree of non-stoichiometry x and dets. the **hydrogen** absorption **capacity** of the alloy. The electrochem. studies show that as x increases, the max. discharge capacity first increases from 365.7 mAh/g (x=3.15) to 398.4 mAh/g (x=3.50) and then decreases to 328.5 mAh/g (x=3.80). Moreover, as x increases from 3.15 to 3.80, the high rate dischargeability (HRD), the exchange c.d. (I0), the limiting c.d. (IL) and the diffusion coeff. (D), of the alloy electrodes all increase first and then decrease.

IT **518345-24-9**, Cobalt 11.3, lanthanum 16.9, magnesium 7.23, nickel 64.6 (atomic) **518345-25-0**, Cobalt 11.5, lanthanum 16.3, magnesium 6.98, nickel 65.1 (atomic) **518345-26-1**, Cobalt 11.7, lanthanum 15.6, magnesium 6.67, nickel 66.2 (atomic) **518345-27-2**, Cobalt 11.8, lanthanum 15, magnesium 6.45, nickel 66.7 (atomic) **518345-28-3**, Cobalt 11.9, lanthanum 14.6, magnesium 6.25, nickel 67.3 (atomic)
(microstructural and electrochem. properties of La0.7Mg0.3(Ni0.85Co0.15)x (x=3.15-3.80) hydrogen storage electrode alloys)

RN 518345-24-9 HCA
CN Nickel alloy, base, Ni 54,La 34,Co 9.5,Mg 2.5 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	54	7440-02-0
La	34	7439-91-0
Co	9.5	7440-48-4
Mg	2.5	7439-95-4

RN 518345-25-0 HCA
CN Nickel alloy, base, Ni 55,La 33,Co 9.8,Mg 2.4 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number

Ni	55	7440-02-0
La	33	7439-91-0
Co	9.8	7440-48-4
Mg	2.4	7439-95-4

RN 518345-26-1 HCA
CN Nickel alloy, base, Ni 56,La 31,Co 10,Mg 2.3 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	56	7440-02-0
La	31	7439-91-0
Co	10	7440-48-4
Mg	2.3	7439-95-4

RN 518345-27-2 HCA
CN Nickel alloy, base, Ni 57,La 30,Co 10,Mg 2.3 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	57	7440-02-0
La	30	7439-91-0
Co	10	7440-48-4
Mg	2.3	7439-95-4

RN 518345-28-3 HCA
CN Nickel alloy, base, Ni 58,La 30,Co 10,Mg 2.2 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	58	7440-02-0
La	30	7439-91-0
Co	10	7440-48-4
Mg	2.2	7439-95-4

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 76
IT **Anodic** polarization
Battery electrodes
Hydriding
(microstructural and electrochem. properties of La0.7Mg0.3(Ni0.85Co0.15)x (x=3.15-3.80) hydrogen storage electrode alloys)
IT Secondary **batteries**

(nickel-metal hydride; microstructural and electrochem. properties of La0.7Mg0.3(Ni0.85Co0.15)x (x=3.15-3.80) hydrogen storage electrode alloys)

IT **518345-24-9**, Cobalt 11.3, lanthanum 16.9, magnesium 7.23, nickel 64.6 (atomic) **518345-25-0**, Cobalt 11.5, lanthanum 16.3, magnesium 6.98, nickel 65.1 (atomic) **518345-26-1**, Cobalt 11.7, lanthanum 15.6, magnesium 6.67, nickel 66.2 (atomic) **518345-27-2**, Cobalt 11.8, lanthanum 15, magnesium 6.45, nickel 66.7 (atomic) **518345-28-3**, Cobalt 11.9, lanthanum 14.6, magnesium 6.25, nickel 67.3 (atomic)
(microstructural and electrochem. properties of La0.7Mg0.3(Ni0.85Co0.15)x (x=3.15-3.80) hydrogen storage electrode alloys)

L27 ANSWER 24 OF 25 HCA

132:95766 Secondary alkaline **batteries** using **anodes** containing hydrogen-absorbing alloy powder. Irie, Shuichiro; Endo, Masahiro (Toshiba Battery Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2000021397 A2 20000121, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-186547 19980701.

AB The **batteries** have **anodes** contg. H-absorbing alloy powder Ln1-xMgx(Ni1-yTy)z (Ln = lanthanoid, Ca, Sr, Sc, Y, Ti, Zr, and/or Hf; T = V, Nb, Ta, Cr, Mo, Mn, Fe, Co, Al, Ga, Zn, Sn, In, Cu, Si, P, and/or B; 0 < x ≤ 1; 0 ≤ y ≤ 0.5; 2.5 ≤ z ≤ 4.5) showing satn. magnetization of surface ferromagnetic components 0.1-9.0 emu/m2 after 48-h immersion in 8 N aq. KOH at 60°. The **batteries** show high discharge capacity and long cycle life. Cylindrical secondary nickel-hydrogen **batteries** using the **anodes** contg. H-absorbing alloy La0.7Mg0.3(Ni0.9Co0.1)3.0 are shown.

IT **250777-11-8**
(**hydrogen**-absorbing; high-**capacity** secondary alk. **batteries** using **anodes** contg. satn. magnetization-controlled H-absorbing alloys)

RN 250777-11-8 HCA

CN Nickel alloy, base, Ni 56,La 35,Co 6.3,Mg 2.6 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Ni	56	7440-02-0
La	35	7439-91-0
Co	6.3	7440-48-4
Mg	2.6	7439-95-4

IC ICM H01M004-38
ICS C22C019-00; H01M004-24; H01M010-30

CC **52-2** (Electrochemical, Radiational, and Thermal Energy

Technology)
Section cross-reference(s): 56

ST **battery anode** hydrogen absorbing alloy; satn magnetization alloy hydrogen **anode battery;** nickel hydrogen **battery anode** alloy

IT **Battery anodes**
(high-capacity secondary alk. **batteries** using **anodes** contg. satn. magnetization-controlled H-absorbing alloys)

IT Rare earth alloys
(high-capacity secondary alk. **batteries** using **anodes** contg. satn. magnetization-controlled H-absorbing alloys)

IT Secondary **batteries**
(nickel-**hydrogen;** high-**capacity** secondary alk. **batteries** using **anodes** contg. satn. magnetization-controlled H-absorbing alloys)

IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses 7440-03-1, Niobium, uses 7440-20-2, Scandium, uses 7440-21-3, Silicon, uses 7440-24-6, Strontium, uses 7440-25-7, Tantalum, uses 7440-31-5, Tin, uses 7440-32-6, Titanium, uses 7440-42-8, Boron, uses 7440-47-3, Chromium, uses 7440-50-8, Copper, uses 7440-55-3, Gallium, uses 7440-58-6, Hafnium, uses 7440-62-2, Vanadium, uses 7440-65-5, Yttrium, uses 7440-66-6, Zinc, uses 7440-67-7, Zirconium, uses 7440-70-2, Calcium, uses 7440-74-6, Indium, uses 7723-14-0, Phosphorus, uses
(H-absorbing alloys contg.; high-capacity secondary alk. **batteries** using **anodes** contg. satn. magnetization-controlled H-absorbing alloys)

IT 1333-74-0, Hydrogen, uses
(alloys contg. absorbed; high-capacity secondary alk. **batteries** using **anodes** contg. satn. magnetization-controlled H-absorbing alloys)

IT **250777-11-8**
(**hydrogen**-absorbing; high-**capacity** secondary alk. **batteries** using **anodes** contg. satn. magnetization-controlled H-absorbing alloys)

L27 ANSWER 25 OF 25 HCA COPYRIGHT 2006 ACS on STN

97:41545 Magnesium-alloy hydrides. Nachman, J. F.; Rohy, D. A. (Solar Turbines Int., San Diego, CA, 92138, USA). Met.-Hydrogen Syst., Proc. Miami Int. Symp., Meeting Date 1981, 557-600. Editor(s): Veziroglu, T. Nejat. Pergamon: Oxford, UK. (English) 1982. CODEN: 47RUAA.

AB Progress in the development and characterization of Mg and Mg-alloy hydrides is summarized with emphasis on lightwt. hydrides suitable for automotive H fuel-storage applications. The topics covered

include: effects of alloy compn. on **H capacity**, compn.-pressure-temp. relations, hydriding-dehydriding kinetics, comminution, and the useful life of hydrides when subjected to hydriding-dehydriding cycling.

IT **79771-89-4**
(absorbent for hydrogen, properties of)

RN 79771-89-4 HCA

CN Magnesium alloy, base, Mg 68,Cu 21,Ni 9.7,Y 1.5 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Mg	68	7439-95-4
Cu	21	7440-50-8
Ni	9.7	7440-02-0
Y	1.5	7440-65-5

CC **52-3** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56

IT 79771-88-3 **79771-89-4** 82435-17-4
(absorbent for hydrogen, properties of)